APRU

IRIDeS
International Research Institute of Disaster Science

TOHOKU UNIVERSITY

2nd APRU-IRIDeS April-2018

Workshop on Building Disaster Resistant Universities

Tecnológico de Monterrey

AUR
Architecture and Urban **Resilience**

Tecnológico de Monterrey

Tecnológico de Monterrey
Escuela de Arquitectura,
Arte y Diseño

UNIVERSITAT POLITÈCNICA DE CATALUNYA BARCELONATECH

ETSAB Escola Tècnica Superior d'Arquitectura de Barcelona

SISTEMA NACIONAL DE PROTECCIÓN CIVIL | CENAPRED
MÉXICO

AUR
Architecture and Urban **Resilience**

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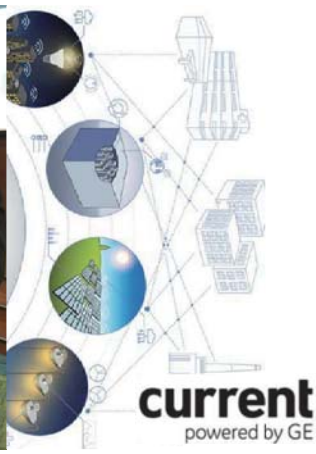
30th Anniversary **MEXICAN CIVIL PROTECTION**

Ciudad de Mexico Campus. **Mexico 2016**



Diseño para reducción de desastres

25 de abril, **Campus Ciudad de México.** *Auditorio Planta baja de oficinas 1*
Campus en la Zona Metropolitana de la Ciudad de México

8:40	**Evento inaugural**
9:00	***"La protección Civil en México, de la reacción a la prevención, algunos ejemplos"*** **Conferencia inaugural. Dr. Carlos Miguel Valdés González** Director General del CENAPRED
9:50	***"Dirección de Análisis y Gestión de Riesgos del CENAPRED"*** **Conferencia. Ing. Oscar Zepeda Ramos** Dirección de Análisis y Gestión de Riesgos del CENAPRED
11:00	***"El impacto de los fenómenos naturales en las estructuras"*** **Conferencia. Dr. Óscar López Bátiz** Investigador del CENAPRED y Catedrático del Tecnológico de Monterrey
11:50	***"Arquitectura Inmediata"*** **Conferencia Magistral. Dr. Fernando Ramos Galino** Investigador y Exdirector de Escuela Técnica Superior de Arquitectura de Barcelona ETSAB, Universidad Politécnica de Cataluña
12:40	***"Tendencias, Big Data. Current"*** **Conferencia. Pascoal Koutras** CEO North Cone. GE Intelligent Environments, General Electric México
13:30	**Cierre del Evento. Dr. Hugo Elizalde Siller** Director de la Escuela de Diseño Ingeniería y Arquitectura del Campus Ciudad de México Líder del Cluster de Arquitectura del Campus Metropolitano de la Ciudad de México.

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30th Anniversary
MEXICAN CIVIL PROTECTION
Ciudad de Mexico Campus. **Mexico 2016**

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Santa Fe + Estado de Mexico + Ciudad de Mexico Campus . **Mexico 2016**

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Santa Fe + Estado de Mexico + Ciudad de Mexico Campus . **Mexico 2016**

Diseño para reducción de desastres

26 de abril, Visita al CENAPRED

Campus en la Zona Metropolitana de la Ciudad de México

Estudiantes de Arquitectura de Campus Estado de México

7:00 Salida de Campus Estado de México
9:00 Llegada la CENAPRED
10:30 Regreso a Campus Estado de México

Estudiantes de Ingeniería Civil de Campus Estado de México

9:00 Salida de Campus Estado de México
11:00 Llegada la CENAPRED
12:30 Regreso a Campus Estado de México

Diseño para reducción de desastres

27 de abril Visita al CENAPRED y Workshop

Campus en la Zona Metropolitana de la Ciudad de México

CENAPRED

Estudiantes de Arquitectura de Campus Santa Fe

7:00 Salida de Campus Santa Fe
8:00 Llegada la CENAPRED
8:30 Regreso a Campus Santa Fe

Estudiantes de Ingeniería Civil de Campus Estado de México

8:30 Salida de Campus Ciudad de México
9:30 Llegada la CENAPRED
11:00 Regreso a Campus Ciudad de México

Campus Estado de México

9:00 **Workshop Arquitectura Inmediata**
Tendencias Current

Diseño para reducción de desastres

28 de abril Workshop

Campus en la Zona Metropolitana de la Ciudad de México

Campus Santa Fe

7:00 **Workshop Arquitectura Inmediata**
Tendencias Current

Campus Ciudad de México

16:00 **Workshop Arquitectura Inmediata**
Tendencias Current

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Santa Fe + Estado de Mexico + Ciudad de Mexico Campus . **Mexico 2016**

Architectural and construction solutions resistant to natural phenomena

TEC DE MONTERREY I AGENCIA INFORMATIVA

In commemoration of the 30th anniversary of the National System of Civil Protection, from 25 to 29 April 2016 students of Civil Engineering and Architecture of the Campus in the Metropolitan Area of Mexico City of Tecnológico de Monterrey organized a series of conferences and workshops aimed at to prepare people to know what to do in situations of risk and natural disasters and to the students of the area, to learn about new construction techniques to create structures much more resistant to natural phenomena. The conference cycle, held at the Mexico City Campus, was inaugurated with a talk by the Director of the National Center for Disaster Prevention (CENAPRED), Dr. Carlos Miguel Valdés González, who spoke about civil protection in Mexico and the reaction to prevention, emphasizing the need for professionals prepared for these events. "Natural disasters do not discriminate, they only affect those who are not prepared," he said.Other lecturers were Dr. Fernando Ramos Galino, Researcher and Exdirector of the School of Architecture of Barcelona, engineer Oscar Zepeda Ramos of the Risk Analysis and Management Department of CENAPRED; Dr. Óscar López Bátiz, Researcher at CENAPRED and Professor at Tecnológico de Monterrey, who spoke about the impact of natural phenomena on structures. Also there was Pascoal Koutras, CEO of North Cone GE Intelligent Environments, General Electric Mexico, addressing the issue of Big Data trends in the field of intelligent spaces.In the three Campus of the Metropolitan Area of Mexico City, the students participated in a Design workshop for disaster reduction, given by Dr. Fernando Ramos Galino, where they talked about the important role played by architects and engineers in the catastrophes. Likewise, Dr. Ramos Galino gave the workshop of Immediate Architecture in Campus Santa Fe, which discussed the importance of building strong structures for all economic sectors regardless of the areas where they are located.

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Santa Fe Campus . **Mexico 2016**

Semana i i week

2016

UNIVERSITAT POLITÈCNICA DE CATALUNYA BARCELONATECH

Arquitectura inmediata

Fernando Juan Ramos Galino

Tecnológico de Monterrey

Arquitectura inmediata: del manifiesto a la urgencia de lo más necesario

Arquitectura inmediata.
De la arquitectura como manifiesto
a la arquitectura urgente de lo más necesario

Università IUAV. Architettura Venezia
Campus Dorsoduro 18-23 Sept. 2016. Venezia (Italia)
Ins.Tecnológico de Monterrey. (México)
Campus de Santa Fe. 26-30 Sept. 2016.Ciudad de México (México)
Campus de Puebla (México) 25-29 Sept. 2017
en red con los Campus de Monterrey y Guadalajara (México)
Campus Hidalgo 2 octubre 2017.
Universitat Politècnica de Catalunya
Campus Diagonal Sur. 10-15 Oct. 2017E.T.S. Arquitectura de Barcelona (España)

Fernando Juan Ramos Galino
Prof. Em. Dr. Arq. Escuela de Arquitectura de Barcelona .Universidad Politécnica de Catalunya
Codirector Comisión de Enseñanza de la Arquitectura de la Unión Internacional de Arquitectos
Ponente General del Consejo UNESCO-UIA para la Validación en Arquitectura

"Design habitable spaces for natural disasters"

Tecnologico de Monterrey – CENAPRED - UPC

The student will work directly with researchers from the Polytechnic University of Catalonia and the National Center for Disaster Prevention; will understand the basic concepts of architectural structures and constructions and their behavior in the face of a natural disaster.You will experience through the different researches carried out by our experts the social, urban and structural repercussions, before and after a disaster, product of a natural disaster such as earthquakes, hurricanes and tsunamis. It will be sensitive to the immediacy of the needs following a natural disaster.

Semana i - **Design for natural disasters**

In collaboration with the Polytechnic University of Catalonia and the ETSAB Higher Technical School of Architecture of Barcelona. National Center for Disaster Prevention CENAPRED

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Santa Fe Campus . **Mexico 2016**

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Santa Fe Campus . **Mexico 2016**

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Santa Fe Campus . **Mexico 2017**

Semestre i

i semester

2017

Architects
Civil Engineers
Designers
Economists
Sociologists
Historians
Internationalists
Industrial Engineer
Engineers in sustainable
Development
Urban Planners
Experts:
Ethics
Citizenship
Structures
Immediate architecture

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Puebla Campus . **Mexico 2016**

Diploma

2017-2018

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NATURAL DISASTERS URBAN RESILIENCE DIPLOMA

Puebla Campus . **Mexico 2016**

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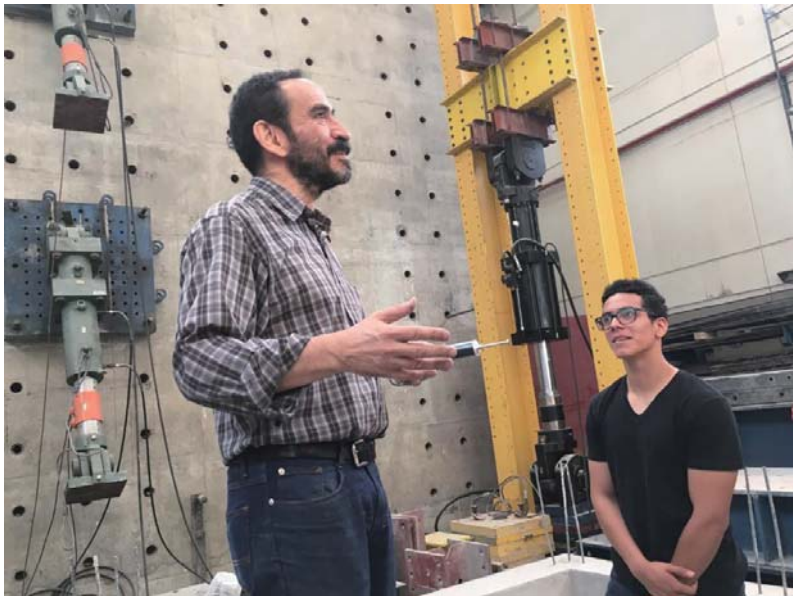
Puebla Campus . **Mexico 2016**



1. Theory and casuistry of natural disaster. Planning and prevention in four scenarios: the day after, one week after, the month after and one year before
2. Instruments of design, evaluation and structural intervention on buildings or infrastructure affected
3. Architecture and design as tools of change: analysis of behavior and criteria for the design, evaluation and recovery of hospitals, educational buildings, housing and public buildings

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St. Francis Xavier University, Antigonish . **Nova Scotia, Canada 2017**

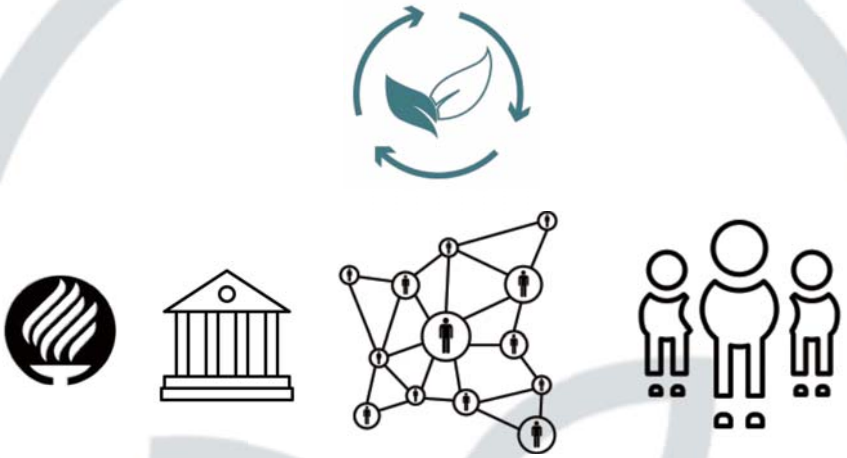
Coady International Institute ignites leadership | http://www.coady.stfx.ca/

Established by St. Francis Xavier University in 1959, the Coady International Institute is a world-renowned centre of excellence in community-based development and leadership education.

Coady Women's Leadership Fellowship 2017

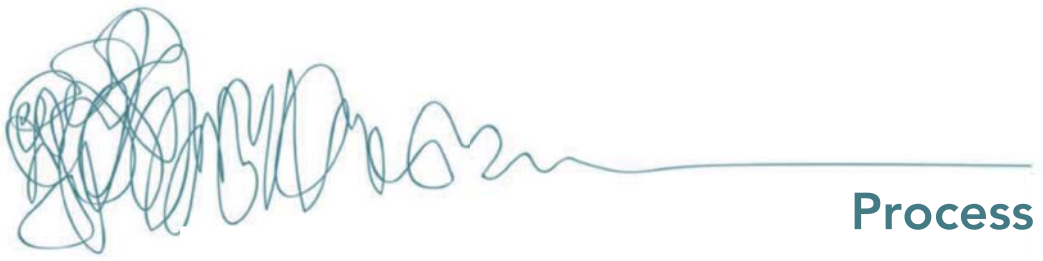
Action Research **“trueque”**

house of midwives´s evolution



trueque

Multidisciplinary



Process

project

action **research EAAD**

trueque

Chiapas eXperience

midwives house evolution

house of midwives´s evolution

trueque

Chiapas eXperience

midwives house evolution

midwives house

resilience phenomena natural

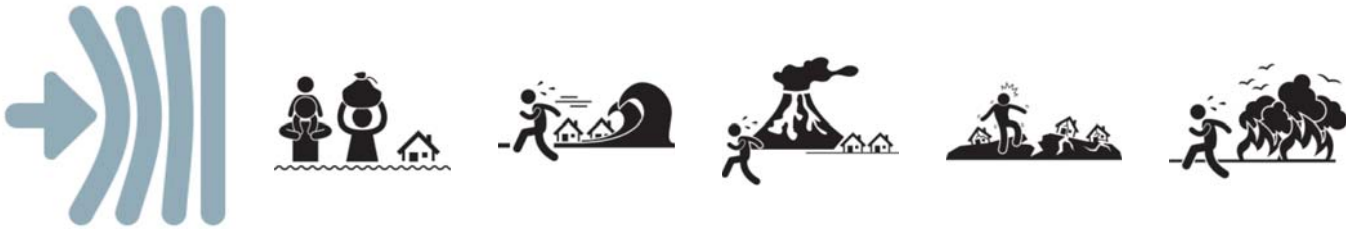
biomimicry

house of midwives´s evolution

trueque

Chiapas eXperience

resilience phenomena natural



house of midwives´s evolution

midwives project´s background

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Santa Fe Campus . **Mexico 2016**

Semana i
i week

2017

Tecnológico de Monterrey

Tecnológico de Monterrey
Escuela de Arquitectura,
Arte y Diseño

SISTEMA NACIONAL DE
PROTECCIÓN CIVIL | CENAPRED
MÉXICO

ETSAB Escola Tècnica Superior d'Arquitectura de Barcelona

"El valle de México, una de las ciudades más pobladas del mundo vivió entre polvo y muerte. El sismo del 85 nos puso a prueba como seres humanos, pero también a las instituciones que aún no podían creer la magnitud del daño. Aun cuando el gobierno federal hizo oficial 6 mil defunciones, cifras no oficiales estimaron un número de muertos no menor a 10 mil."
http://www.spps.gob.mx/avisos/1120-los-terremotos-de-1985.html

Diez veces más débil que el de 1985...

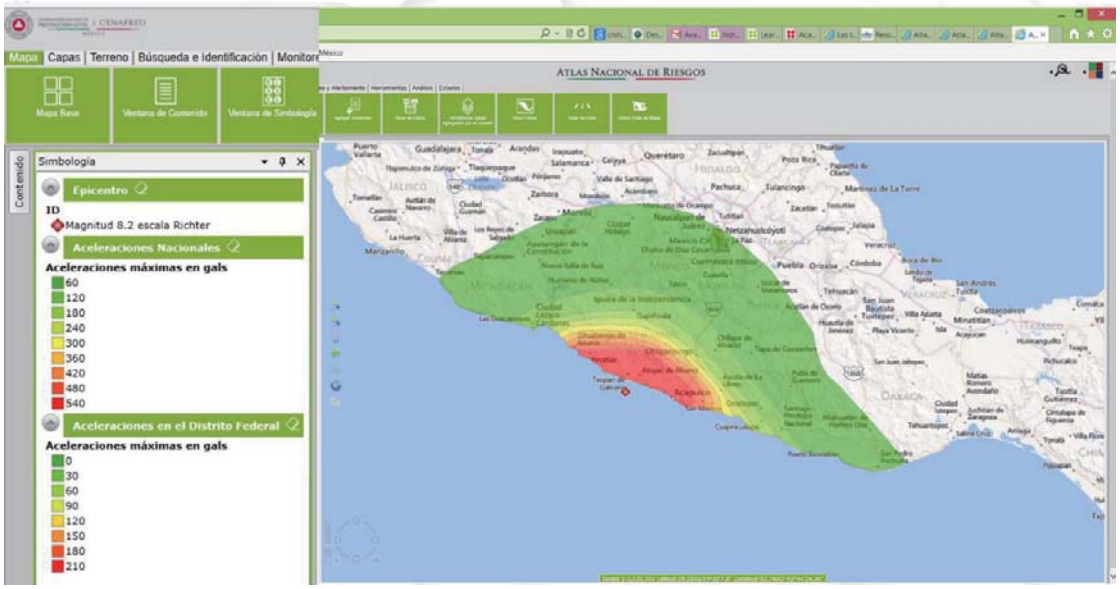
"CIUDAD DE MÉXICO (apro).- Les recuerdo algo: la "escala sísmica de Richter" es logarítmica (base 10), y no lineal. Esto significa que un terremoto de 8.1 grados tiene una magnitud 10 veces mayor que uno de 7.1 (y no es sólo 10% u 15% más fuerte, como podría pensarse). Dicho de otro modo: ayer, un sismo con una magnitud diez veces menor que el de 1985 derribó unos 40 edificios y mató a casi 100 personas en la Ciudad de México."
http://www.proceso.com.mx/504094/diez-veces-debil-1985/amp

SEMANA i 2017
"Resiliencia Urbana ante el sismo 19/09/17"
Dra. Patricia Torres Sánchez
Dr. Fernando Ramos Galino
Dr. Óscar López Bátiz

SEGOB
SECRETARÍA DE GOBERNACIÓN

COORDINACIÓN NACIONAL DE PROTECCIÓN CIVIL | CENAPRED
MÉXICO

Herramientas de apoyo, Atlas Nacional de Riesgos



Experto:
Oscar López Bátiz
Subdirector de Riesgos Estructurales del Centro Nacional de Prevención de Desastres CENAPRED

DISEÑO PARA SUPERVIVIENTES AFECTADOS POR DESASTRES

Arquitectura inmediata

Expertos:
Fernando Ramos Galino
Director de la Comisión para la Educación en Arquitectura de la Unión Internacional de Arquitectos (UIA).
Ponente General del UNESCO- UIA Validation Council for Architectural Education

Patricia Torres Sánchez
Decana Región Sur
Escuela de Arquitectura, Arte y Diseño
Tecnologico de Monterrey


Experto:
Francisco Ayala Aguirre
Director de Diseño y Desarrollo Curricular
Tecnologico de Monterrey
RESILIENCIA
"la capacidad de las personas para funcionar eficazmente de cara a la adversidad y su capacidad de recuperación ante el estrés."
(Sarason y Sarason 2006)
La capacidad que tiene una persona o un grupo de recuperarse frente a las tragedias para seguir proyectando un futuro.


Experto:
Enrique Cruz Gómez
Experto en sismos
Profesor del Tecnologico de Monterrey

Tecnológico de Monterrey

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Escuela de Arquitectura,
Arte y Diseño

SISTEMA NACIONAL DE PROTECCIÓN CIVIL | CENAPRED MÉXICO

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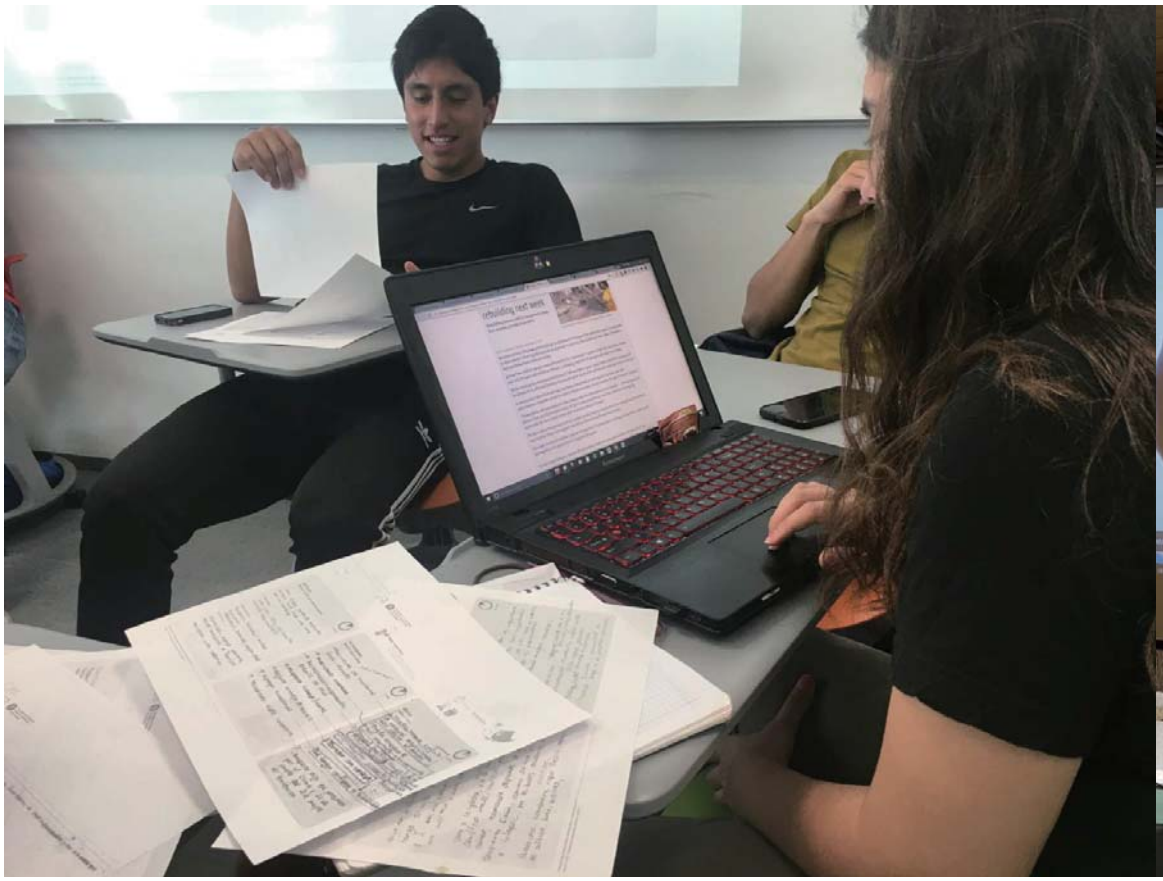
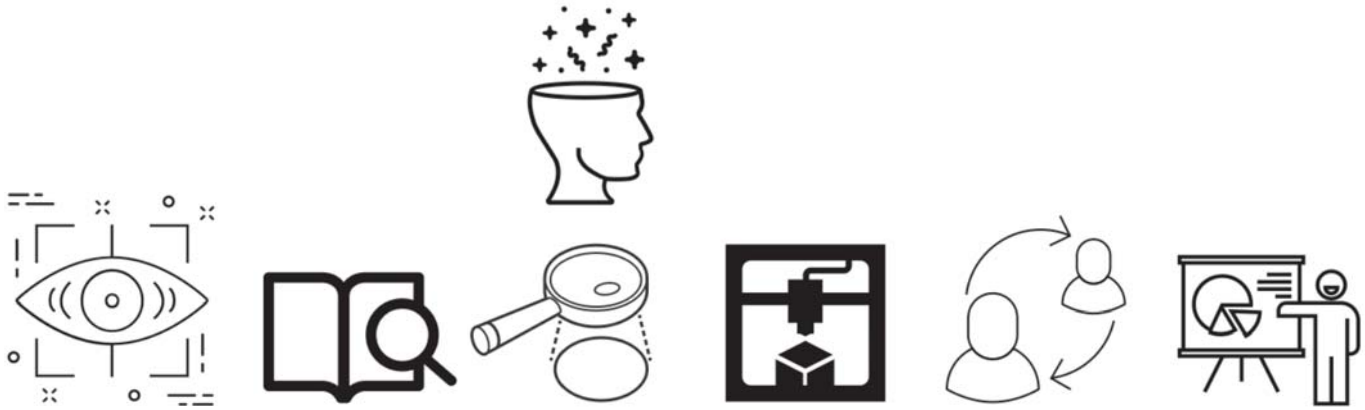
SEMANA i 2017

"Resiliencia Urbana ante el sismo 19/09/17"

Dra. Patricia Torres Sánchez
Dr. Fernando Ramos Galino
Dr. Óscar López Bátiz





observe understand | insight | generate ideas | transform ideas into visible and tangible | Iterate | presentation

sistematic **process** time and resources available

Patricia Torres Sánchez
Decana Región Sur
Escuela de Arquitectura, Arte y Diseño
Tecnologico de Monterrey

persona 1
Extreme users

Tecnológico de Monterrey
Escuela de Arquitectura,
Arte y Diseño

Project

Team

Date

Notes / instructions
"5x?" Try asking "Why" in response to
5 consecutive answers from your customer.

25 min

empathy

what it says...

what it does...

what it use...

25 min

what you think...

what you feel...

a day in the life 2
Whatc & interview your customers

Tecnológico de Monterrey
Escuela de Arquitectura,
Arte y Diseño

Project

Team

Date

Notes / instructions
"5x?" Try asking "Why" in response to
5 consecutive answers from your customer.

25 min

empathy

discover
observes to the user within its context

5 min

making ...

which uses ...

what you need ...

what awaits ...

to interpret
identify opportunities

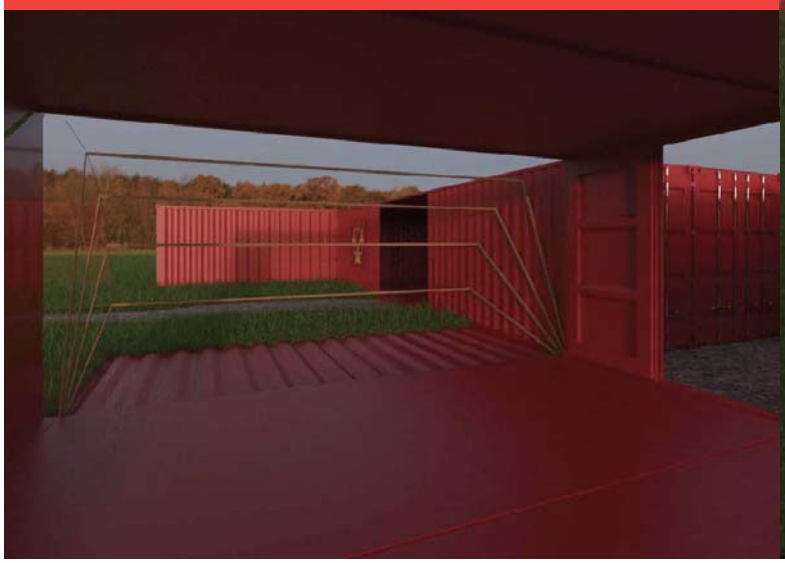
5 min

devise
generate ideas

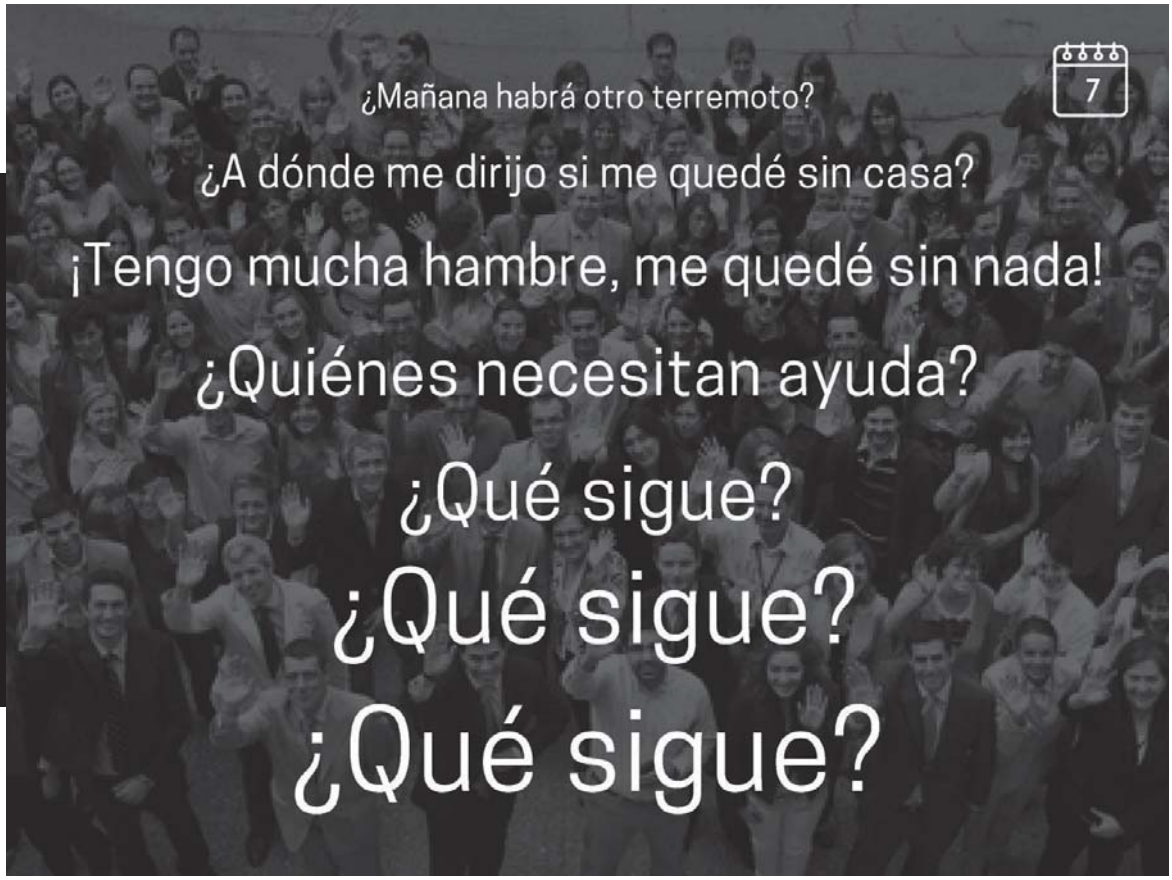
5 min


SEMANA 1


SISMOGRAFO



LA FALTA DE INFORMACIÓN CUESTA VIDAS.




"MÉXICO NO ESTÁ
LLORANDO, ESTÁ DE
PIE AYUDANDO"


Estamos en
SEMANAi
#Semanai
Tecnológico de Monterrey
#Semanai

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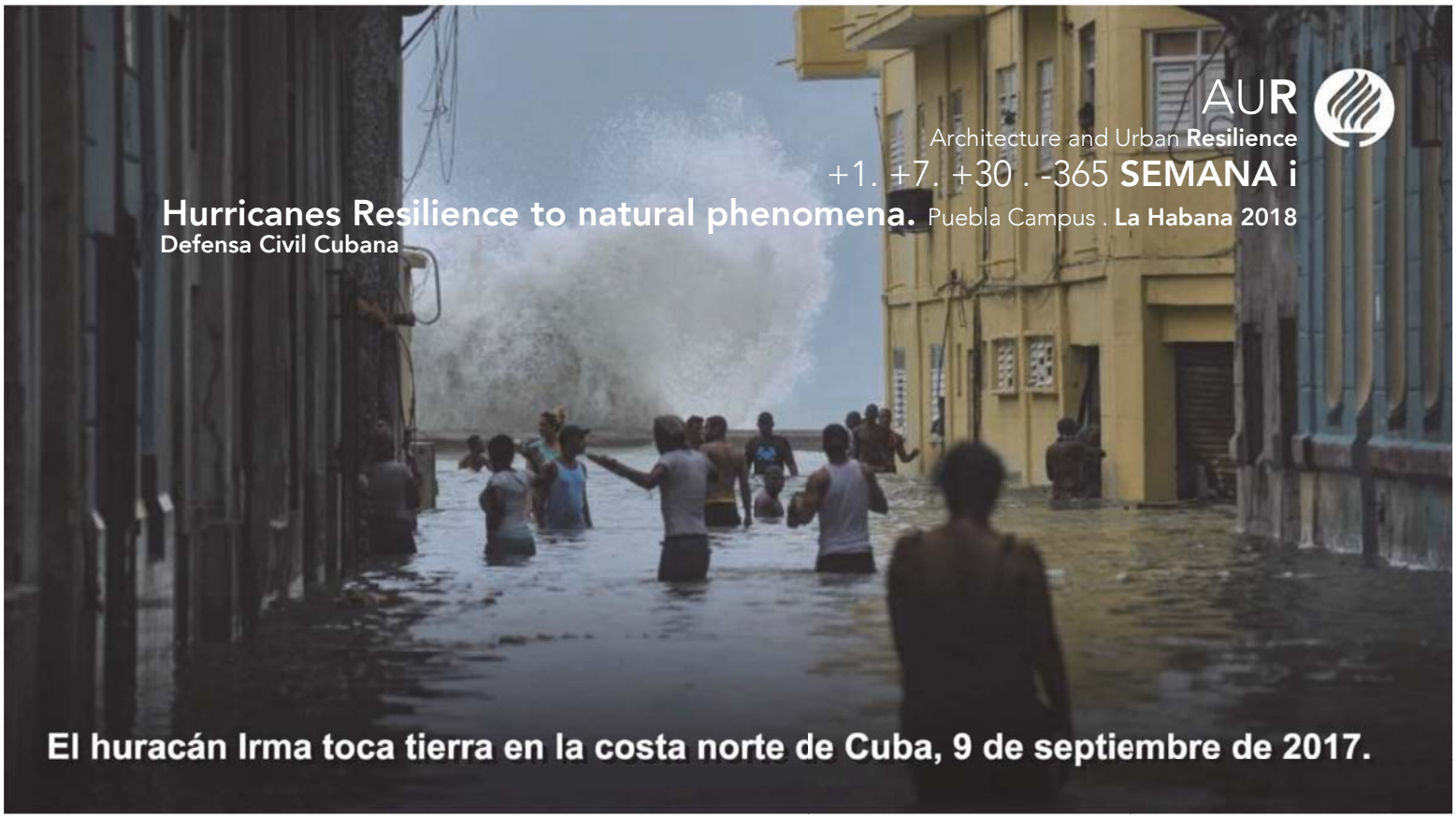
Hurricanes Resilience to natural phenomena. Puebla Campus . **La Habana 2018**

La actividad se enfoca en que los estudiantes de distintas disciplinas que trabajen de manera colaborativa con el fin de propiciar la sensibilización dentro de una comunidad urbana ante el impacto negativo causado por un huracan, a partir de la planificación, el diagnóstico, la acción inmediata y la prevención.

Asi mismo se contribuirá al entendimiento de la ciudad como un sistema flexible con capacidad para recuperarse con rapidez ante los impactos negativos, afrontando las dificultades sociales con tiempos y recursos limitados, en estrecha colaboración con las autoridades y los expertos nacionales e internacionales. Lo anterior podrá llevarse a cabo mediante estrategias de colaboración, organización, acción social, liderazgo, cooperación, ciudadanía y fomento del comportamiento ético.



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Ciudad de Mexico Campus . **Mexico 2017**

Urban **Reneration**

Tecnológico de Monterrey

SEPTEMBER 2017 Rebuilding a neighborhood after an earthquake

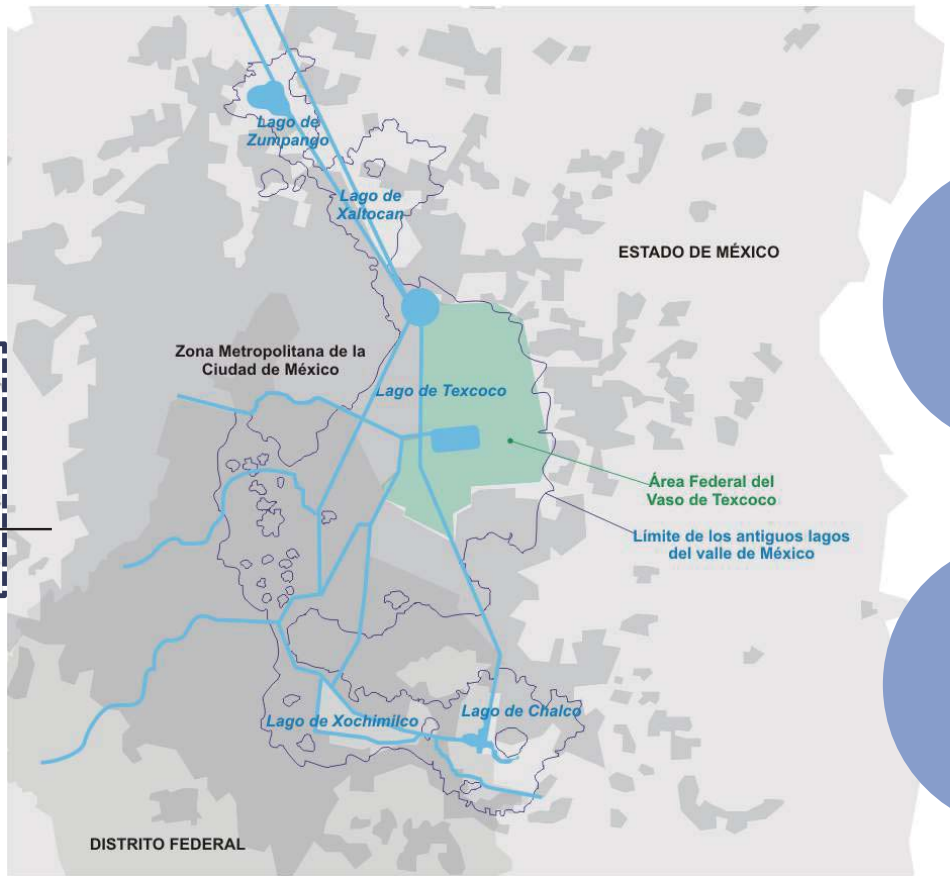
Ciudad de Mexico Campus . **Mexico City 2017**

Tecnológico de Monterrey

DistritoTec

Arturo Pérez Rivera
Tecnológico de Monterrey
arturo.perezrivera@itesm.mx

MÉXICO
120 million
people



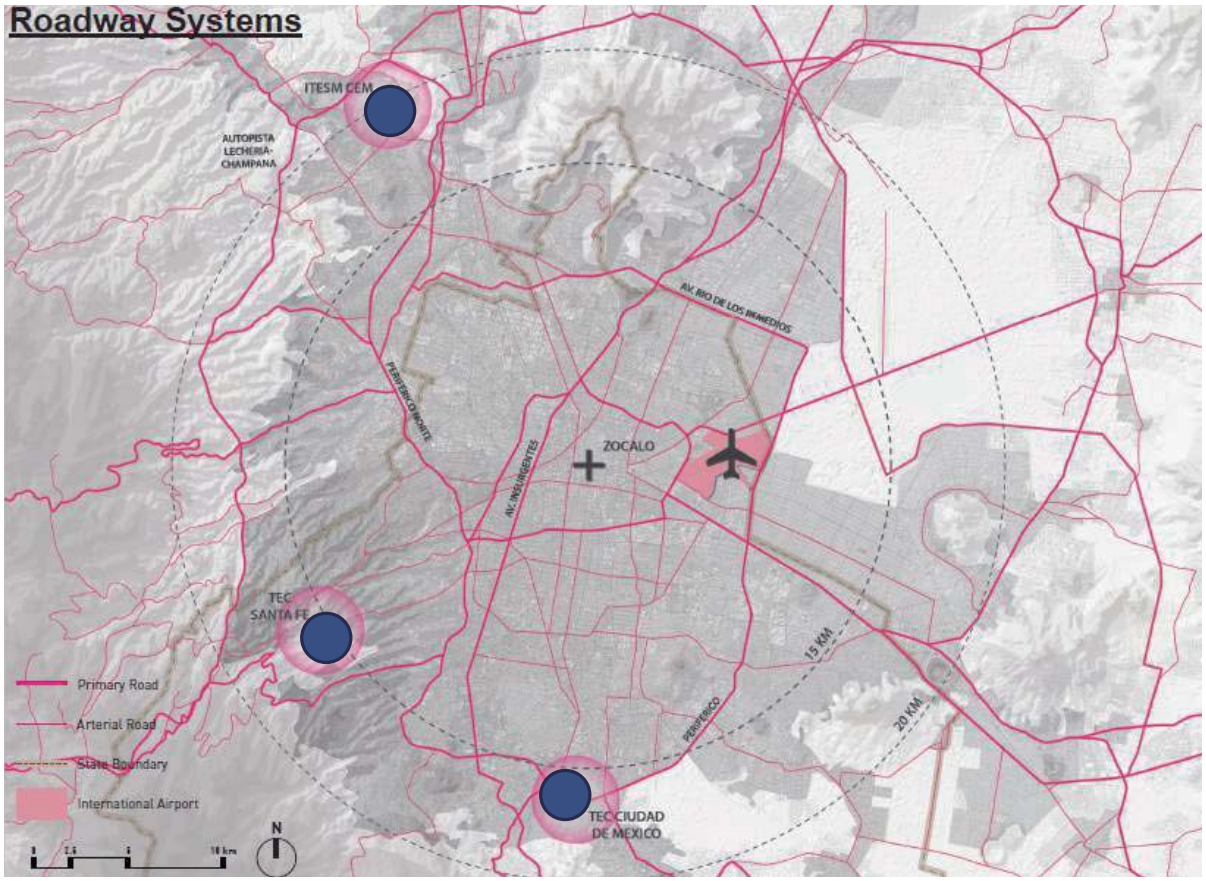
ZMVM
22 million people

ZMVM
4.2 million
houses

CDMX
8.5 million
people

CDMX
2.5 million
houses

Roadway Systems



Tecnológico de Monterrey

Campus TEC DE MONTERREY

Central Region

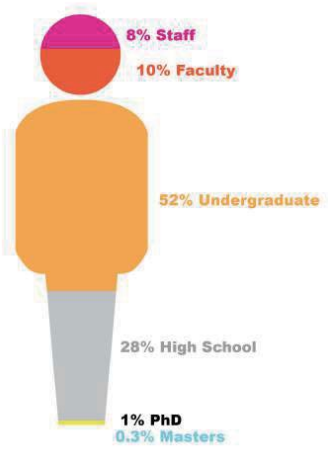
Tecnológico de Monterrey

Campus Locations

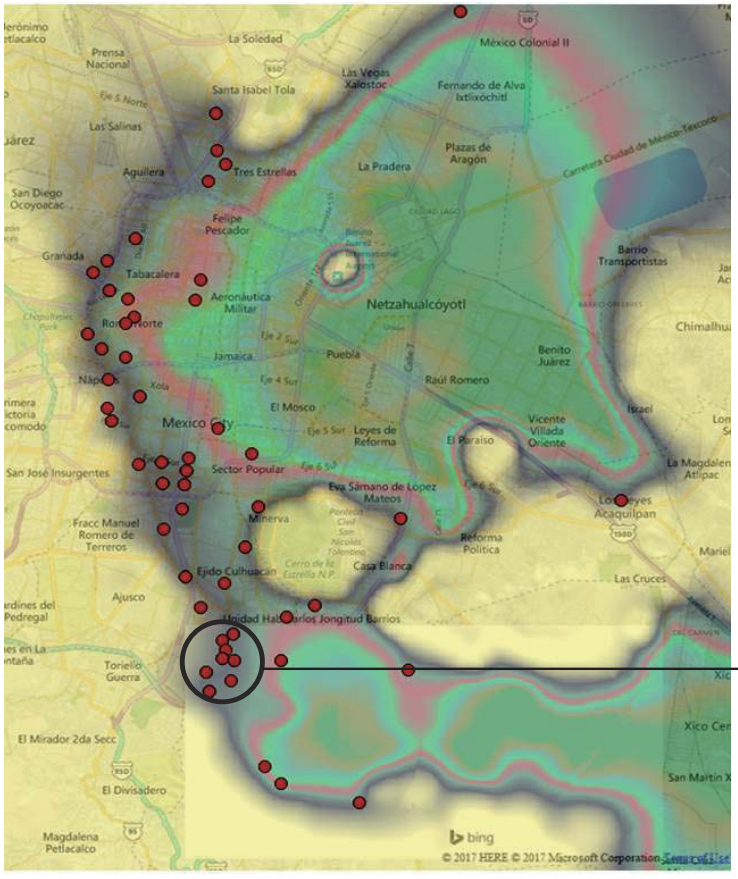
TEC DE MONTERREY Systmen
27 campus
96,000 students

Urbanism Office
3 years ago

TOTAL TEC POPULATION
(inclusing High School)



MÉXICO CITY
september 19th
2017



Tecnológico de Monterrey

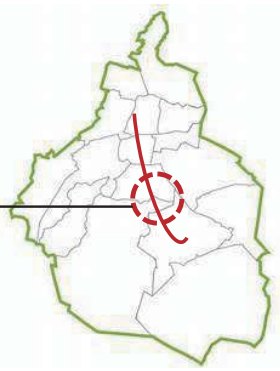
Earthquake september 19th 2017
Magnitude 7.1

369 dead people
167 dead people in Mexico City
1,900 injured

Damage location

South of the city
Housing, academic and commercial services

Tecnológico de Monterrey



Tecnológico de Monterrey

Mexico City

Tecnológico de Monterrey

Mexico City

There are:
8 thousand students

Surface
24.5ha

Increasing to 10 thousand students

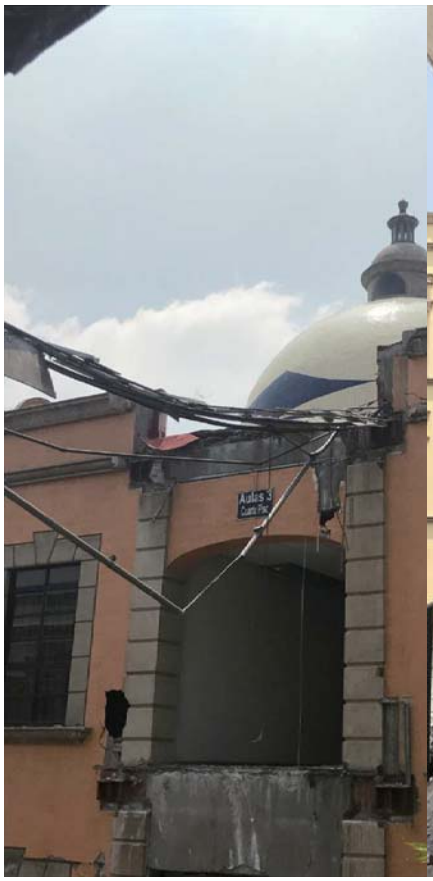
Tecnológico de Monterrey

Mexico City

DAMAGE AREA

79%
FACILITIES

11 BUILDINGS TO BE DEMOLISH



RETHINKING THE NEW CAMPUS IMPROVING RELATIONS WITH NEIGHBORHOOD

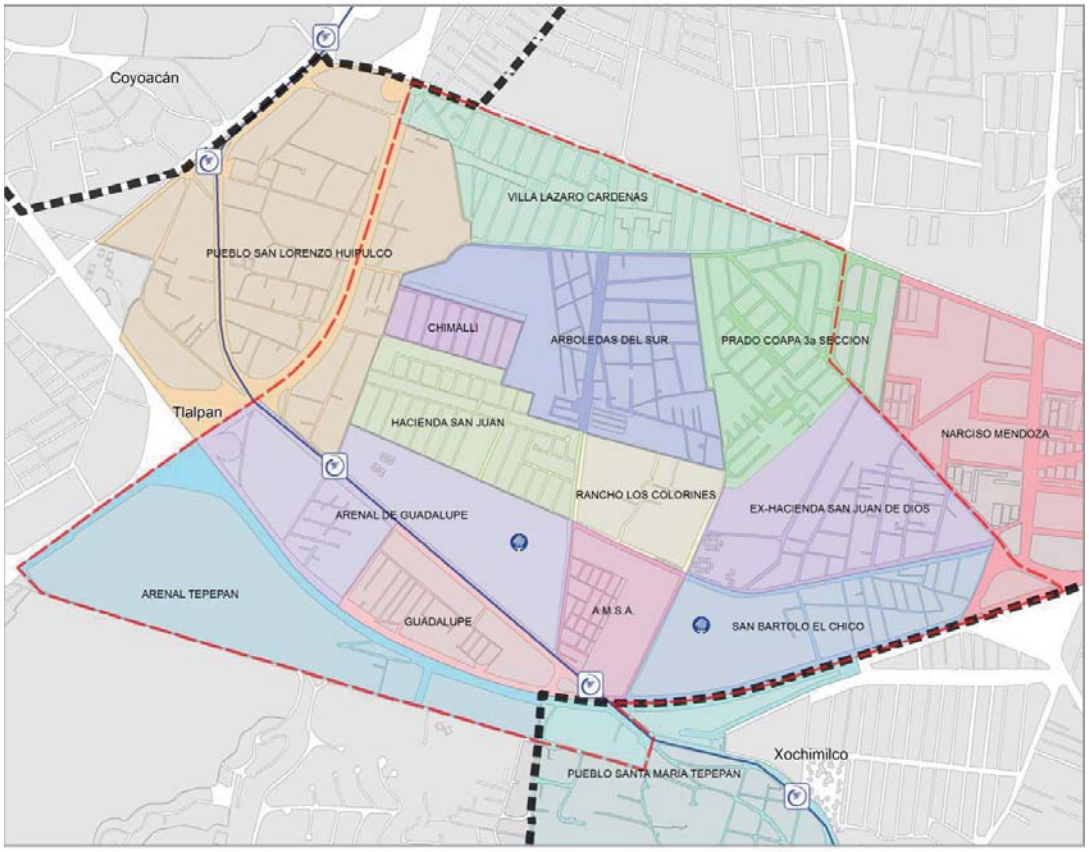
RESILIENCIE ● REBUILD ● REHABILITATION

TRASFORMING EARTHQUAKE AS AN OPPORTUNITY

RESILIENCIE ● REBUILD ● REHABILITATION

Urban regeneration elements

- Redefining a territorial vocation in the area
- Promote a normative that allow regeneration
- Strengthen a new urban centrality based on its territorial vocation capable of attracting and retaining talent
- Attract young population linked to educational equipment
- Renew and expand the infrastructure and urban equipment
- Achieve a functional and social integration of the campus with the territory and the society that integrates it
  Search for new models of participation and social integration
- Generate a resilient neighborhood
- Establish a comprehensive vision of the territory and city and not only university campus
-



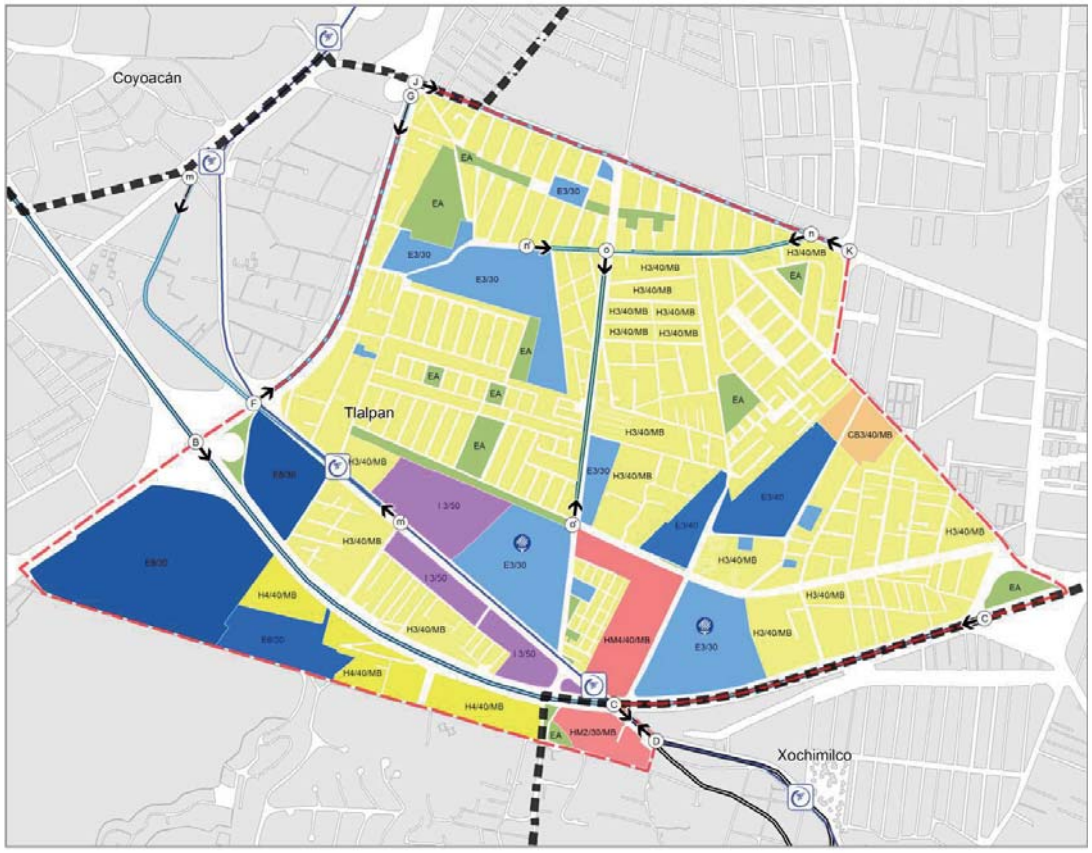
Our Neighborhood

Suface
372ha
15 districts

10,239 houses
11% households
uninhabited

28,000 people

41,300 daily
visitors

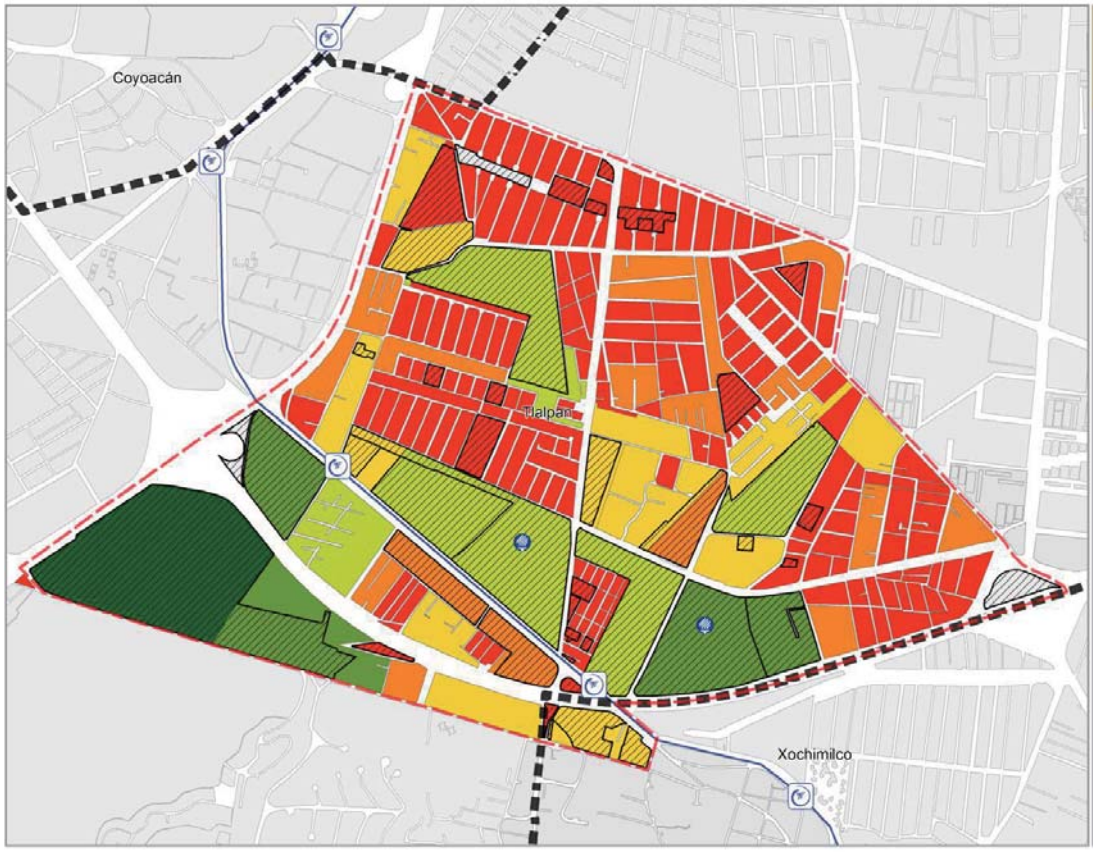


Our Neighborhood

Housing	46.7%
Equipment	25.7%
Industry	4.0%
Open green space	2.6%
Civic center	1.0%
Streets	20%

Low density Housing area

Aged population



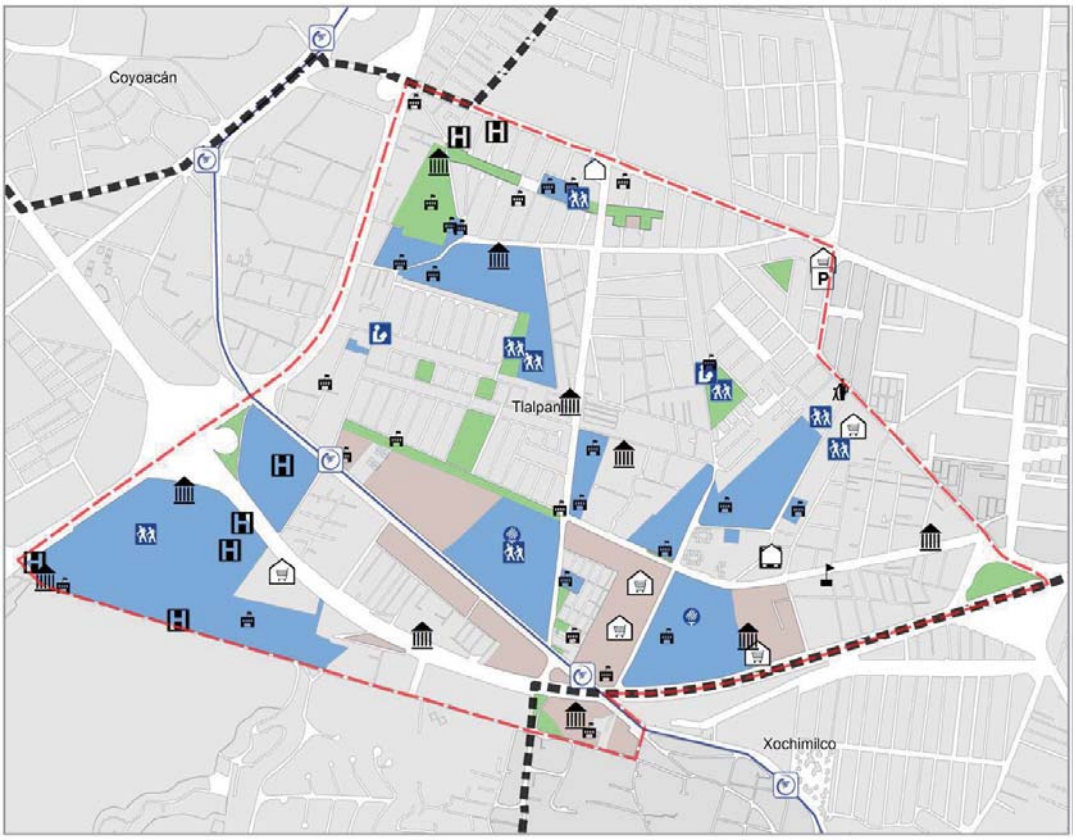
Our Neighborhood

Only 1,200m² are used **20%**

5,500 m² to be developed **80%**

3.5 population per dwelling

Since 2000 the polygon has lost population



Our Neighborhood

30
Academic spaces

8
Commerce

9 Sports

9 Health care
11 Local Administration

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Urban regeneration elements

- Redefining a territorial vocation in the area

  Improve educational offer at all levels with applied research

- Promote new normative that allow regeneration

  For redensification of housing and population

- Strengthen a new urban centrality based on its territorial vocation capable of attracting and retaining talent

  Through urban improvement and accessibility / mobility projects

- Attract young population linked to educational equipment

  Housing and services offer

Urban regeneration elements

- Renew and expand the infrastructure and urban equipment

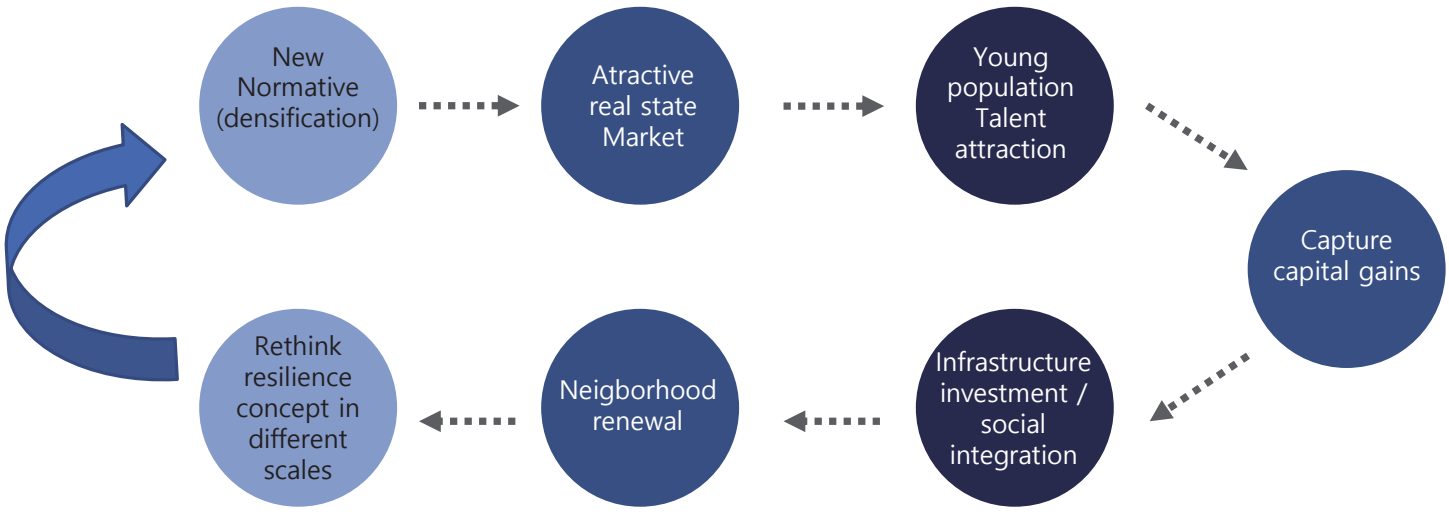
  Through capture of capital gains

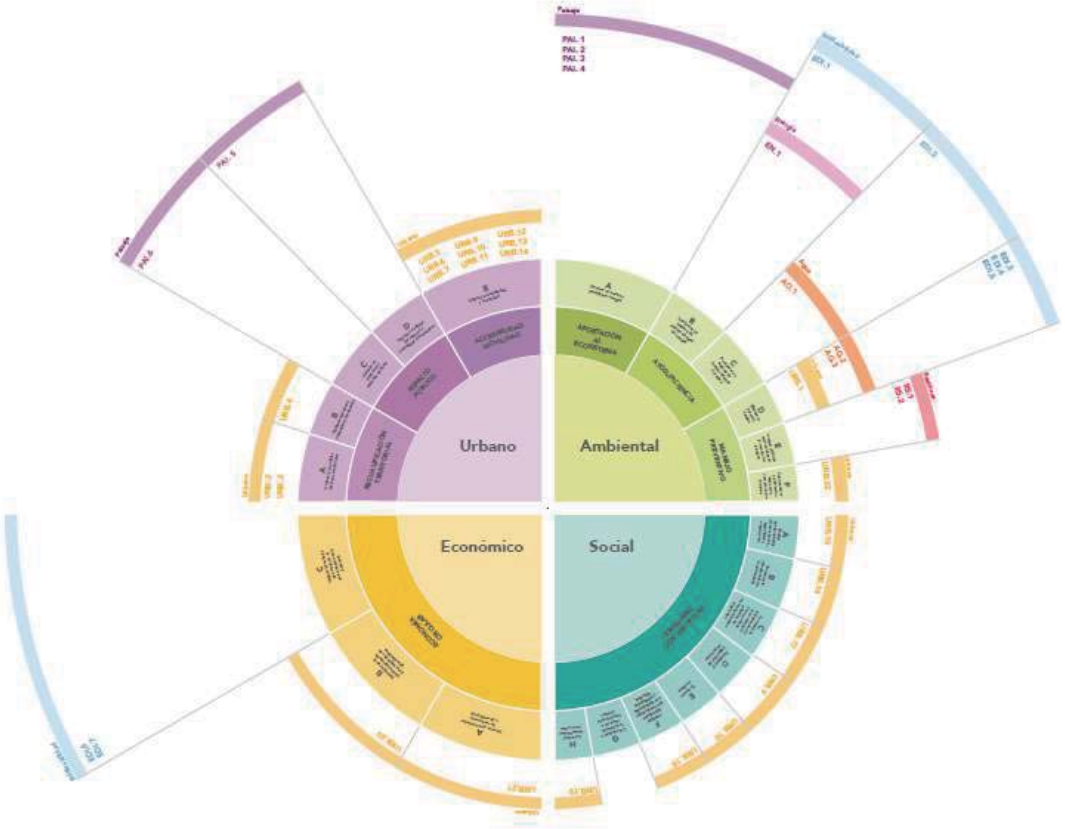
- Achieve a functional and social integration of the campus with the territory and its inhabitants
- **Through public space activation projects**

  Search for new models of participation and social integration

- **Through the integral vision of the territory, involving several actors in a new management model**
- Generate a resilient neighborhood

  Redefining the concept of resilience to adapt it to the needs of the territory





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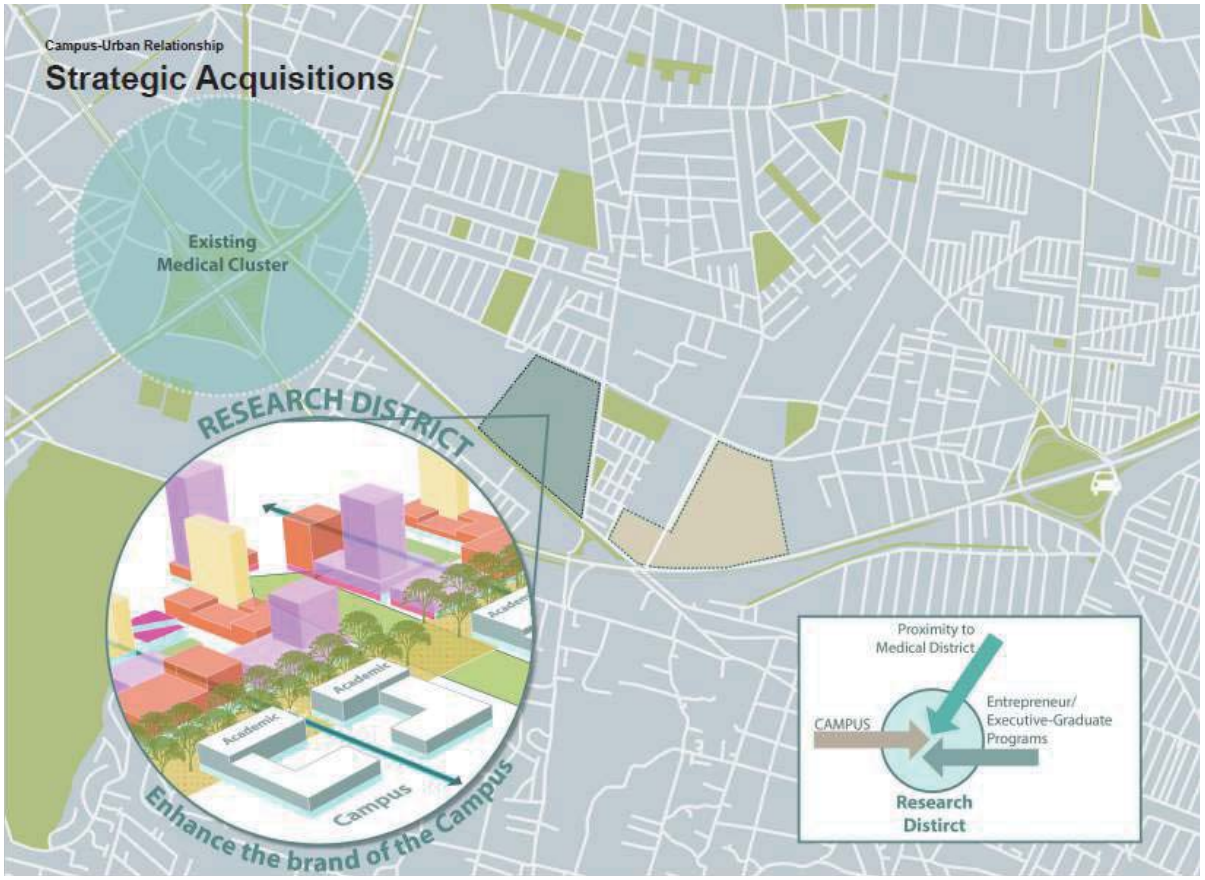
Guide Lines:

- Urban strategies
- Environmental strategies
- Social actions
- Economic development



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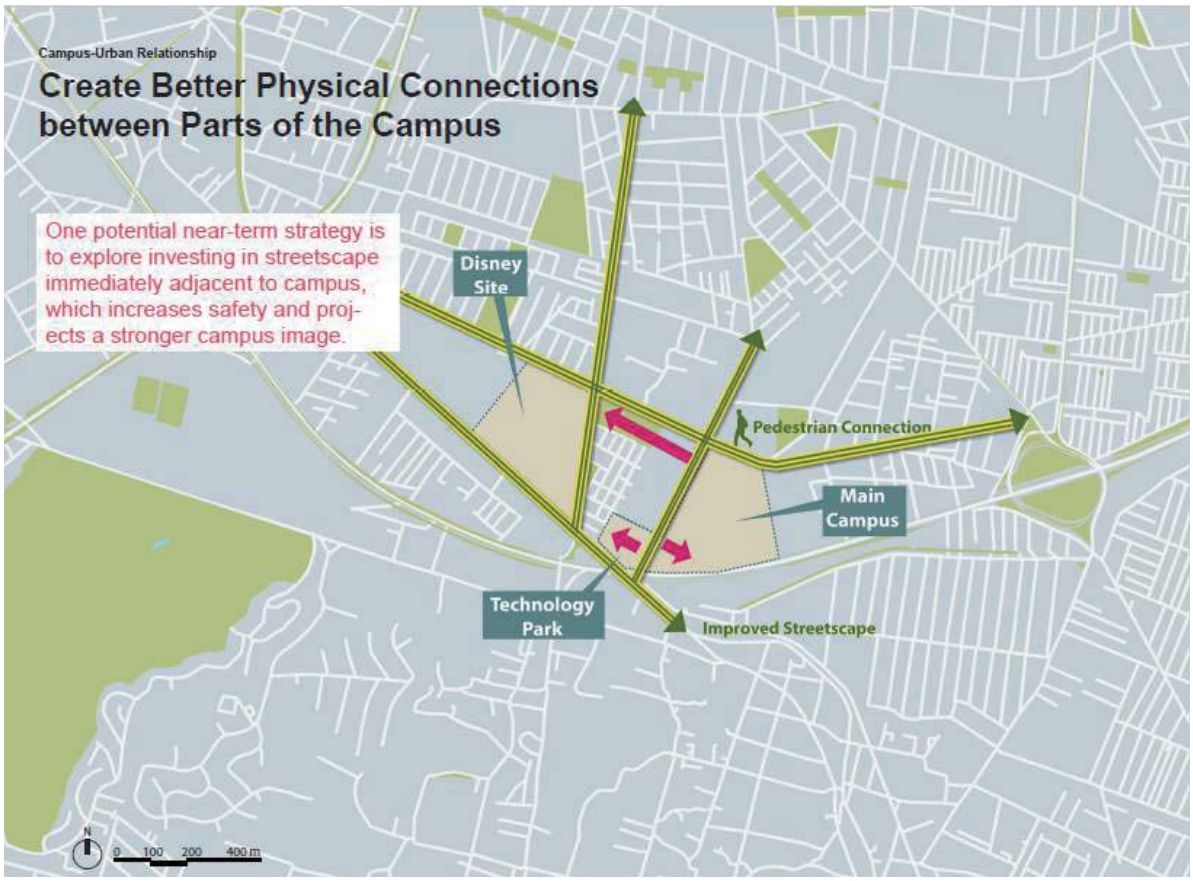
Some projects:

- Research district
- Improve and increase educational offer



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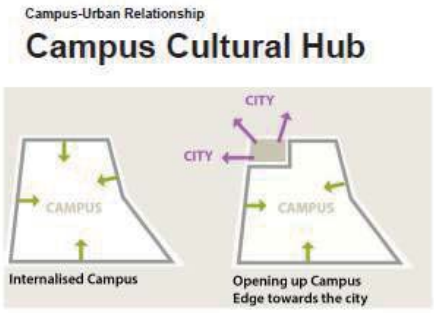
Some projects:

Improve open green space that increase security and promote sustainable mobility

(pedestrian sidewalks and bike use)



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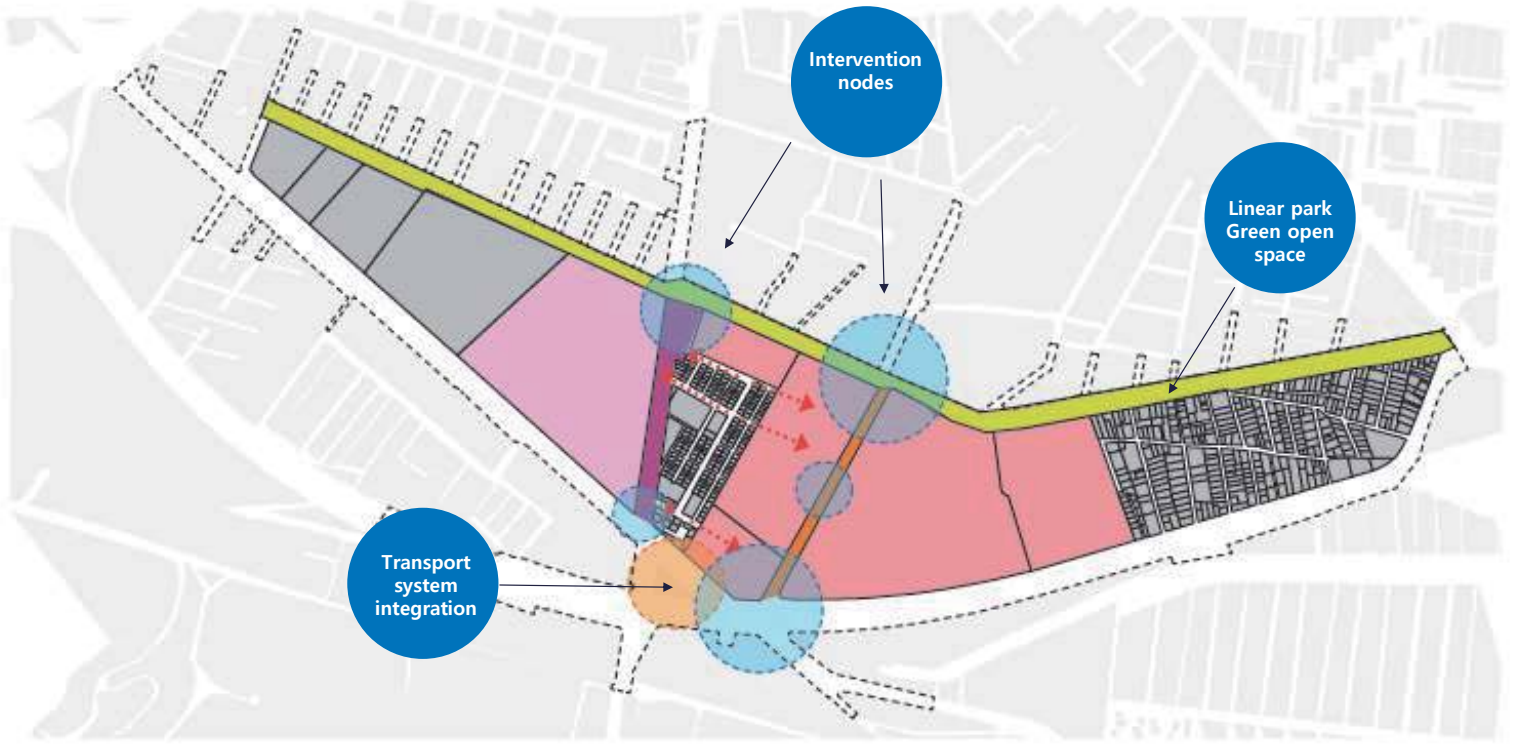
Some projects:

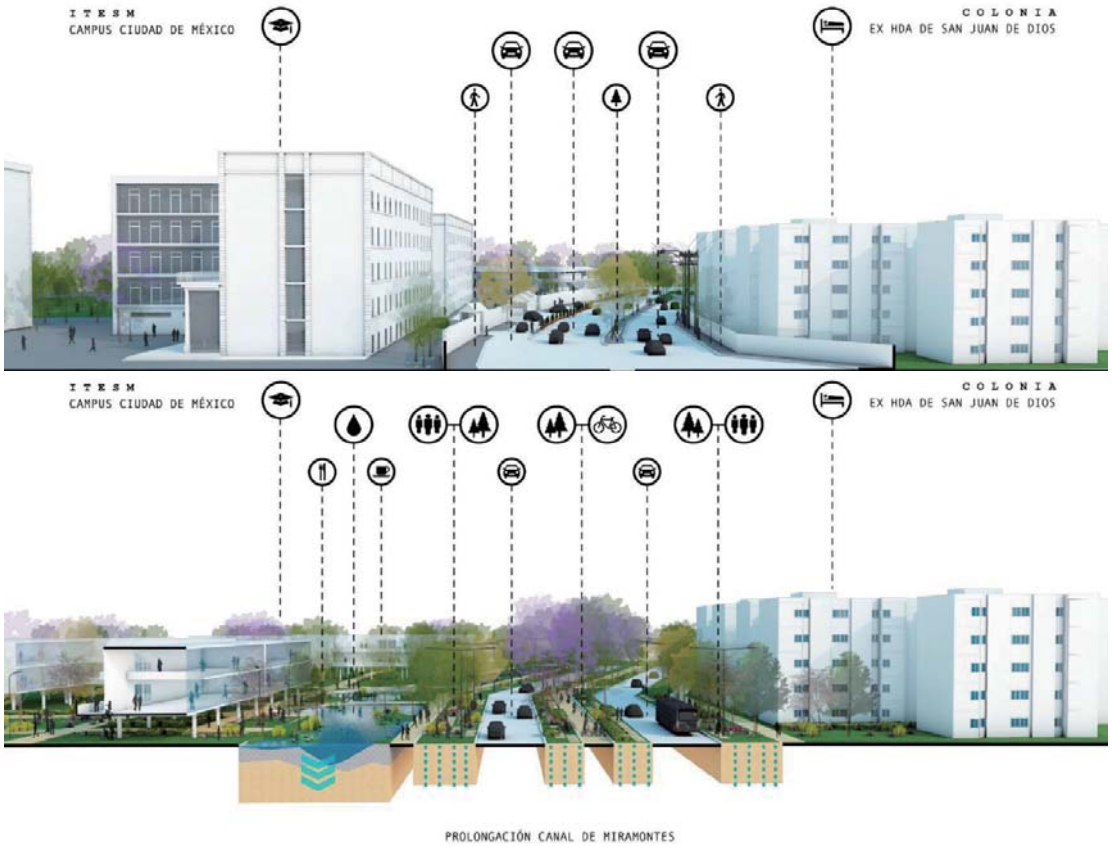
Remove barriers
Permeability
Accessibility

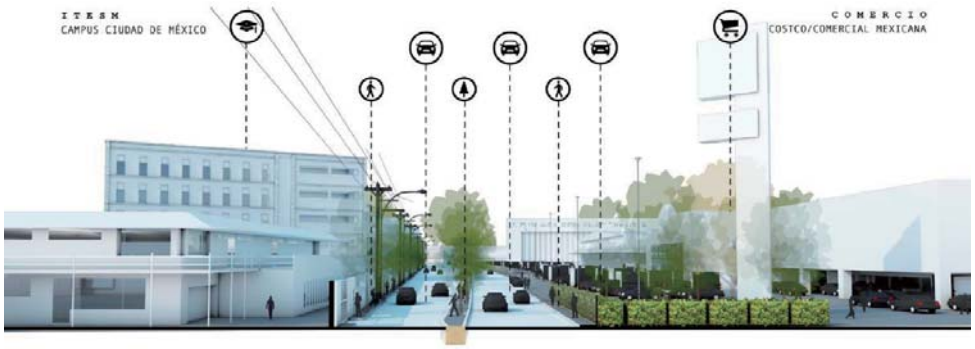
Quality to open public space

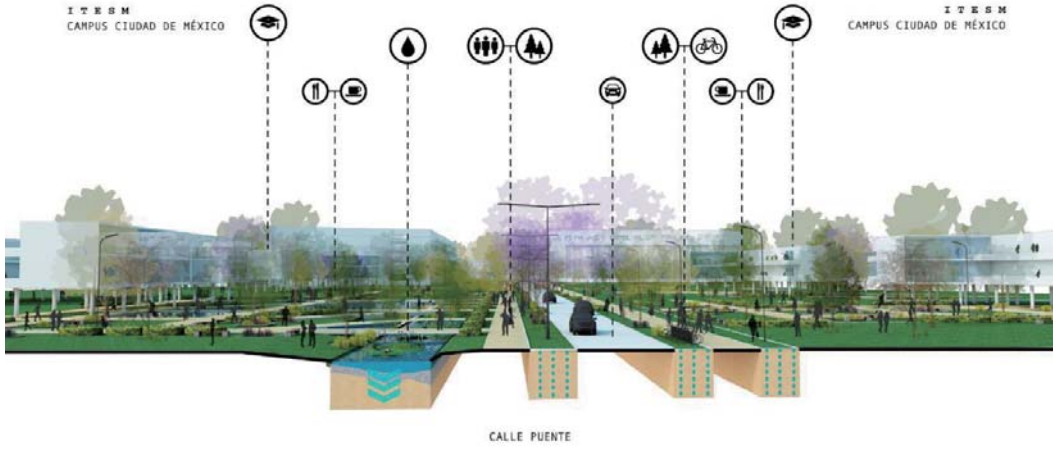
Relationship with the environment and neigborhood

Some Ideas


Intervention nodes
Linear park Green open space
Transport system integration


ITESM
CAMPUS CIUDAD DE MÉXICO
COLONIA
EX HDA DE SAN JUAN DE DIOS
ITESM
CAMPUS CIUDAD DE MÉXICO
COLONIA
EX HDA DE SAN JUAN DE DIOS
PROLONGACIÓN CANAL DE MIRAMONTES





CALLE PUENTE

Strategy	Benefit	Resilience Pillar	4eTec	Implementation	Partners
WATER INDEPENDENCE & BALANCE: reduce/eliminate potable water use/water supply equal to water use/rainwater catchment; Expand waste water treatment plant	Water independece & Aquifer recharge to reverse exploitation of resource, ensure water security	PILLAR 02: PROMOTE WATER RESILIENCE	ENERGY & ENVIRONMENT: OUTDOOR WATER & EXISTING ENVIRONMENT	Rainwater analysis and its impact on campus facilities to reduce the risk of flooding through strategies and uses as infiltration, irrigation and others; irrigation plan strategy with schedule. Landscape design that groups plants with similar irrigation requirements. Drip irrigation, water meters	CDMX Water AEP.dwg in folder; ZONE 6 Xochimilco
ENERGY INDEPENDENCE: onsite renewable, redundant systems; potential central plant expansion or future low energy/net zero	Withstand power outages, provide safe haven for community	PILLAR 03: PLAN FOR URBAN & REGIONAL RESILIENCE	ENERGY & ENVIRONMENT: BOCLIMATIC DESIGN; RENEWABLE ENERGY	The design clearly takes into account local climate and incorporate passive systems and design strategies that ensure user comfort and efficient use of environmental sources; Renewable energy onsite or acquired (3% campus energy); Existing infrastructure capability analysis and improvement strategy proposal	local soloar rep colliboration/preferred vendors
increase biodiversity	increase habitat, natural areas, recreational areas, buffer zones, clear air	PILLAR 03: PLAN FOR URBAN & REGIONAL RESILIENCE	SOCIAL DEVELOPMENT: SPACES FOR INTERACTION AND SOCIAL COHESION	maximize open space and encourge users to occupy open space	
carbon sequestration - retain trees & vegetation	clean air/carbon sink & preserves areas with high enviromental value	PILLAR 03: PLAN FOR URBAN & REGIONAL RESILIENCE	HUMAN WELL-BEING: ACOUTIC QUALITY	Landscape strategies ensure the ideal acoustics depending on the outdoor space function/need.	ITESM tree replacement plan requirement 1:12
electric campus vehicles	reduce CO2 emissions/pollution	PILLAR 03: PLAN FOR URBAN & REGIONAL RESILIENCE	HUMAN WELL-BEING: ACTIVI DESIGN PARKING	Parking spaces for electric vehicles with priority locations and charging spots.	
Siesmic design; building, infrastructure, transportation	prevent damage during earthquakes/flooding of both buildings and infastructure *"there could be another disaster if another large-magnatude earthpake occurs. Continuous resilience bulding is key to protecting humon lives, housing, strategic infastructure services such as potable water, sewage networks, the food supply and the city's transportation network"*	PILLAR 03: PLAN FOR URBAN & REGIONAL RESILIENCE; PILLAR 02: PROMOTE WATER RESILIENCE	ENERGY & ENVIRONMENT: BOCLIMATIC DESIGN; RENEWABLE ENERGY	The design clearly takes into account local climate and incorporate passive systems and design strategies that ensure user comfort and efficient use of environmental sources; Renewable energy onsite or acquired (3% campus energy); Existing infrastructure capability analysis and improvement strategy proposal	
create public green space for social inclusion & integration	address inequality, poverty and wealth concentration, social unrest by providing access and programs & quality urban amenities	PILLAR 03: PLAN FOR URBAN & REGIONAL RESILIENCE	SOCIAL DEVELOPMENT: CONTACT TO THE EXTERIOR & PUBLIC SPACE &URBAN CAMPUS; HUMAN WELL-BEING: OPEN SPACE; ENERGY & ENVIRONMENT: EXISTING PUBLIC SPACE	campus open to exterior (but safe) building placement and landscape harmonize private/public spaces, no big facades @ pedestrian axis; Integration seating, recycling, drinking fountain; Integration of landscape with building design; The feasibility to incorporate for public use EXISTING facilities in health care, cultural, green spaces, retail and commerce within the site.	
create spaces and programs to educate students, community about resilience to be better equipped	address inequality, poverty and wealth concentration, social unrest by providing access and programs	PILLAR 03: PLAN FOR URBAN & REGIONAL RESILIENCE & PILLAR 5: Innovation & Adaptive Capacity	SOCIAL DEVELOPMENT: COMMUNITY DEVELOPMENT	Empower the surrounding community and their life conditions improvement. Educate community on benefits of sustainability	
water treatment/stormwater treatment	heat waves & pathogenic micro-organisms in water	PILLAR 02: PROMOTE WATER RESILIENCE	ENERGY & ENVIROMENT: OUTDOOR WATER	water treatment	
inclusive design	integrated meeting with community and other stakeholders, surround business owners	PILLAR 01: FOSTER REGIONAL COORDINATION	SOCIAL DEVELOPMENT: INCLUSIVE DESIGN	Planning with users and neighbor input understanding user, site and community needs	

Design for buildings to educate	water resiliency,inclusion, etc.	PILLAR 05: DEVELOP INNOVATION AND ADAPTATIVE CAPACITY	SOCIAL DEVELOPMENT: COMMUNITY DEVELOPMENT; ENERGY & ENVIRONMENT: RENEWABLE ENERGY EDUCATION	Empower the surrounding community and their life conditions improvement. Educate community on benefits of sustainability; Continuous learning about renewable energy	
blue & green infrastructure & increase biodiversity, low impact development/bioswales/raingardens/water basins	water management and vegetation to mitigate heat islind, flooding & increase natural habitat, biodiversity, buffer zones, clean air; boost ecosystem services, prevent ponding of water and flooding during rainfall event; create recreation and public enjoyment wher not used as flood mitigation, creates basin to hold water	PILLAR 02: PROMOTE WATER RESILIENCE; PILLAR 03: PLAN FOR URBAN & REGIONAL RESILIENCE	ENERGY & ENVIRONMENT: HEAT ISLAND MITIGATION; SOCIAL DEVELOPMENT: SPACES FOR INTERACTION AND SOCIAL COHESION	The reflectance values of the materials for all surfaces must be certified by a laboratory. Maximize open space and encourage users to occupy open space	
Discourage use of motor vehicles; ban car use inside perimeter of campus	Plan parking at perimeter of campus leaving interior pedestrian friendly	PILLAR 04: IMPROVE MOBILITY	HUMAN WELL-BEING: ACTIVE DESIGN PARKING; ADDITONAL PARKING	Urban mobility integration and active mobility plan that encourage users to transform the culture to reduce car use and transport stress. Parking is not main site and not visible from land boundaries; Parking areas are not a main sight in the campus, since it aims to be planned and design for users and to promote active mobility. Parking areas are located/hided by means of vegetation barriers.	
Improve bike network and bike amenities; bike share program connecting all parts of campus to surrounding community & to other modes of transportation	bike repair stations, bike paths and bike parking	PILLAR 04: IMPROVE MOBILITY	HUMAN WELL-BEING: ACTIVE DESIGN BICYCLE FACILITIES; MOBILITY	Bike paths and facilities through campus; Urban mobility integration and active mobility plan that encourage users to transform the culture to reduce car use and transport stress. Strategy that reflects a direct correlation between the changes in transport means: public, bikes and walking.	
site lighting, smooth walkways and interconnecting paths throughout campus	safe and accessible campus	PILLAR 04: IMPROVE MOBILITY	HUMAN WELL-BEING: ACTIVE DESIGN MOBILITY; ENERGY & ENVIRONMENT: LIGHT POLLUTION REDUCTION	Urban mobility integration and active mobility plan that encourage users to transform the culture to reduce car use and transport stress. Strategy that reflects a direct correlation between the changes in transport means: public, bikes and walking. No uplight to preserve night sky	
adaptable/flexible spaces (indoor /outdoor) that serve as shelter in place, community safe haven in times of crisis	open areas become temporary health and emergency services to the community	PILLAR 5: INNOVATION & ADAPTIVE CAPACITY	HUMAN WELL-BEING: ACTIVE DESIGN OPEN SPACE; ENERGY & ENVIRONMENT: FLEXIBLE DESIGN	Spaces are designed to be adaptable in case of natural disaster in order to serve as temporary shelter.; The project has a 10 years growth plan and has the flexible spaces that can incorporate different uses through the time	
integration of risk management & resilient strategies with neighboring business partners	share shelter/flood/wazer/transportation/operational strategies to ceate synergistic and economic advanages holistically	PILLAR 5: INNOVATION & ADAPTIVE CAPACITY	SOCIAL DEVELOPMENT: INCLUSIVE DESIGN	Planning with users and neighbor input understanding user, site and community needs	
Tie into City's communication platform to facilitate transparency, knowledge and action	greater response time & collaboation in times of stress	PILLAR 5: INNOVATION & ADAPTIVE CAPACITY			
Building Air Quality			HUMAN WELL-BEING: AIR QUALITY	operational standards for maintenance of HVAC	

Reduce emissions through efficiency	reduce CO2 emissions/pollution	PILLAR 03: PLAN FOR URBAN & REGIONAL RESILIENCE	HUMAN WELL-BEING: EXT LIGHTING; ENERGY & ENVIRONMENT-ENERGY EFFICIENCY & REDUCED USE	All LED, Lux, LPD reqmts; Photo cell outdoor lighting, controllabiity of lighting; voltage drop <3%; Option 1: District cooling and heating* Chilled Water Central Water Cooled (Cooling Tower), Option 2: Stand-alone - Chilled water central air cooled. *For option 1 and 2 : Option with variable volume control for water, air and refrigerant; iboth must include BTUh's (MBTU's) monitoring, 0ption 3: In academic buildings (with classrooms) must be evaluated the feasibility of VRF systems. *In case heating is required for comfort in the spaces, water heaters with efficiency higher than 98% under NOx and SOx will be considered as the first option; Water chilling plants efficiency o/ at least .4kW/TR, Efficiency of the entire system of at least .7kW/TR; BMS, energy metering	
WASTE MANAGEMENT PLAN			ENERGY & ENVIRONMENT: WASTE DURING CONSTRUCTION & MATERIAL REUSE	If the project includes renovations, a waste management plan for demolition and construction is designed and implemented.	
LCA			ENERGY & ENVIRONMENT: HEALTHY FINANCES; LCA	Design and Construction / Maintenance Cost analysis viewed over a 30 year period; whole building and specific strategies	
INNOVATION			INNOVATOIN	At least 1 innovation strategy	
Cx?	DO WE HAVE Cx scope?				

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