

SBSE RETREAT 2016

Drivers of Change Workshop

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Workshop Resources

Drivers of Change Card Set

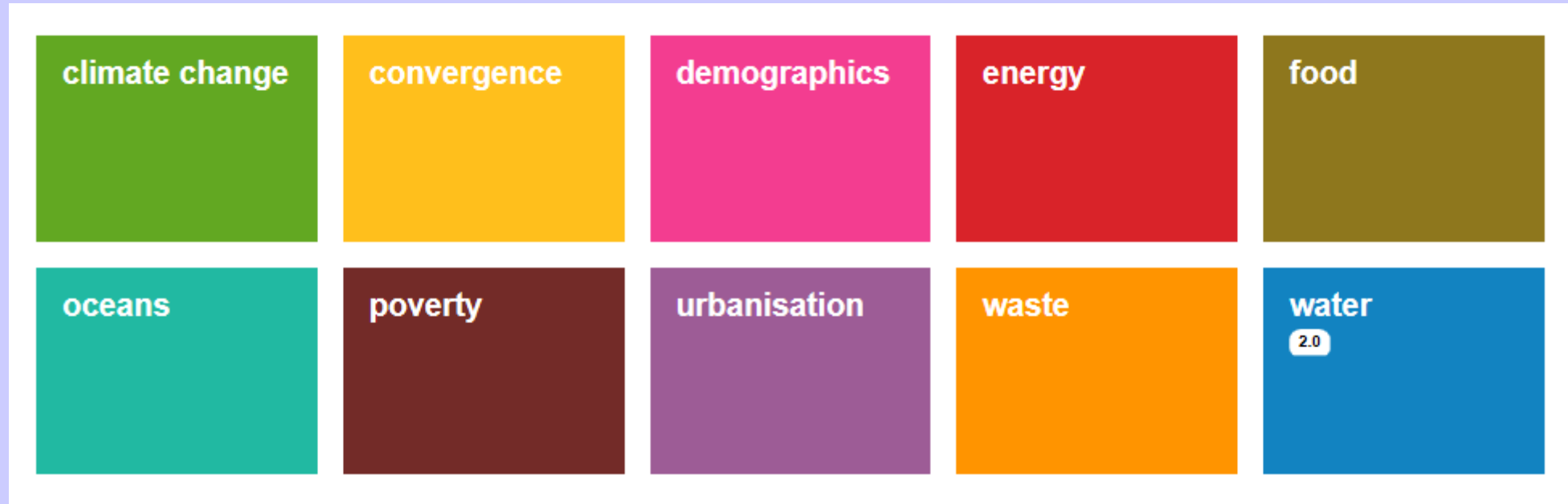


<http://www.driversofchange.com/tools/doc/>

What will our world be like in 2050? Drivers of Change is a research-based publication developed by Arup to help its business and clients identify and explore leading factors which will affect our world in the future.

Each card depicts a single driver. A factoid and rhetorical question are on one face, backed up by a more detailed exploration of the issue on the reverse.

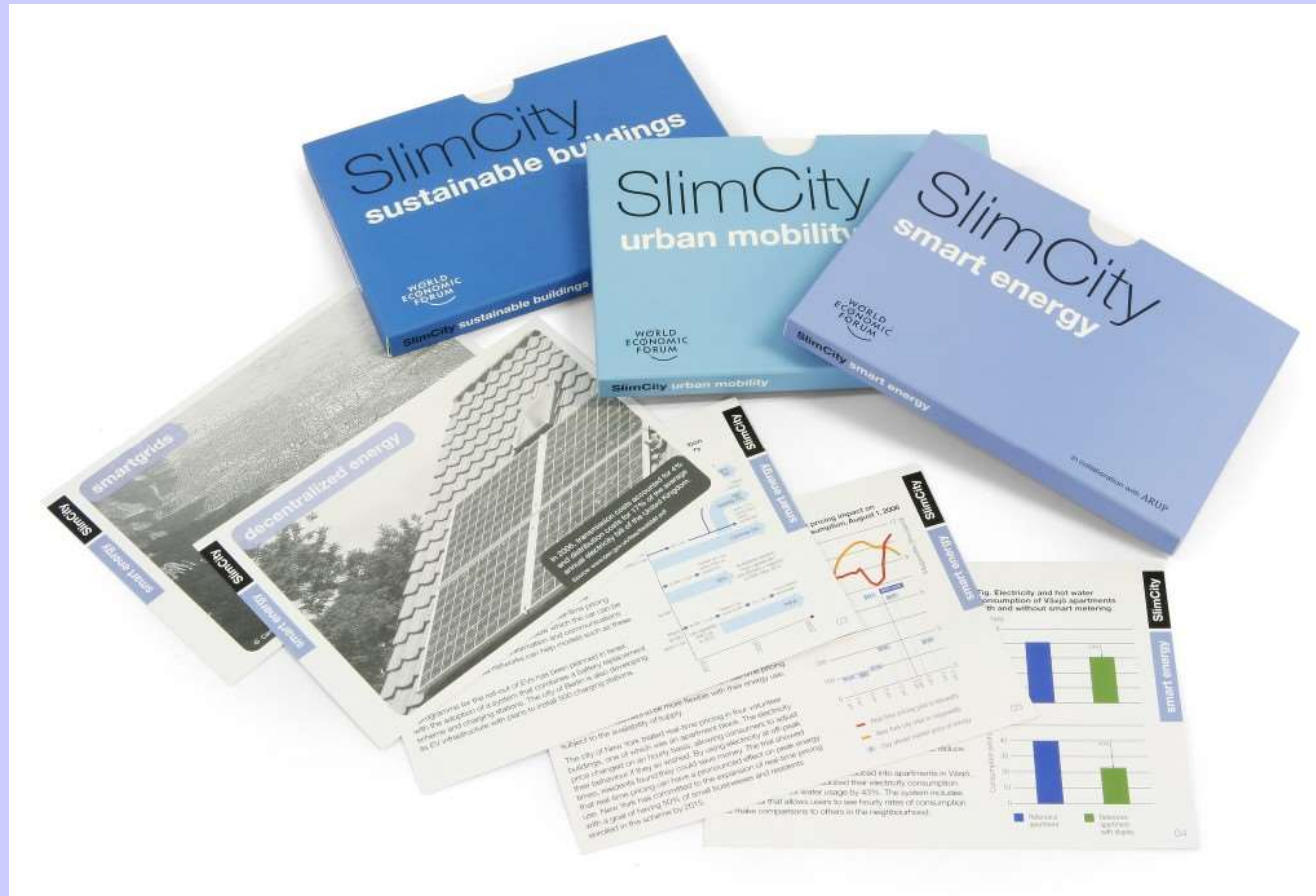
Workshop Resources



Drivers of Change contains 8 card sets that cover the above array of issues.

Workshop Resources

Slim City Card Set

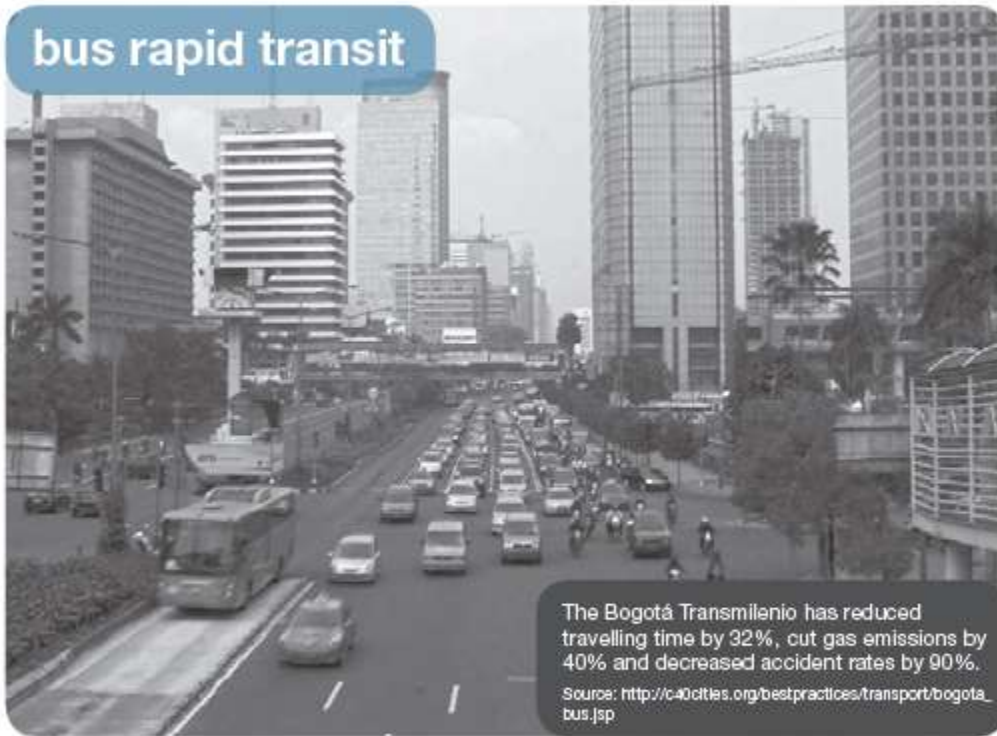


A set of Knowledge Cards that capture global best-practice and policy across urban mobility, smart energy and sustainable buildings.

The cards offer practical solutions to many of the problems facing cities in both the developed and developing world, supporting them towards building a more resilient future. In compiling the cards, Arup's researchers selected content on the basis that any Mayor could ask the question "Could we do this in our city?".

<http://www.driversofchange.com/projects/slimcity/>

Workshop Resources



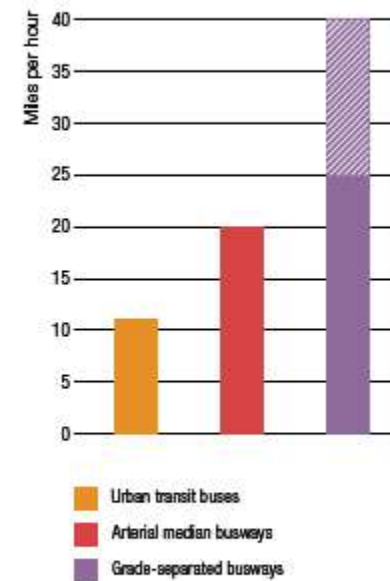
bus rapid transit

Bus Rapid Transit (BRT) is a high-capacity, relatively low-cost public transport solution that can improve urban mobility. It is a permanent, integrated system that uses buses or specialized vehicles on roadways or dedicated lanes to efficiently transport passengers to their destinations, while offering the flexibility to meet transport demand. BRT systems can be customized to community needs and incorporate state-of-the-art, low-cost technologies that result in more passengers and less congestion.

The bus system of Curitiba, Brazil, exemplifies a model BRT system. It is one of the most heavily used, yet low-cost, transit systems in the world, offering many of the features of a subway system – vehicle movements unimpeded by traffic signals and congestion; fare collection prior to boarding; quick passenger loading and unloading – but it is above ground and visible. The Curitiba system pioneered the use of bus-boarding tubes. Around 70% of Curitiba's commuters use the BRT to travel to work.

Many other cities have followed Curitiba's lead, including Bogotá and Mexico City. The TransJakarta busway is a 12.9 km corridor through the city's centre; it opened in 2004, and since then six further lines have been added to the system. It was built in nine months and was inspired by the BRT systems in Bogotá and Curitiba. It has reduced CO₂ emissions and improved safety and efficiency. Many cities are now considering the introduction of BRT systems, for example Cape Town in South Africa.

Fig. Bus system speed comparison



Workshop Resources

Cities Alive Workshop Card Set



<http://www.driversofchange.com/projects/cities-alive/>

Supported by the Landscape Institute and Royal Botanical Gardens, Kew, Cities Alive names five key requirements, which, if implemented, would have significant implications for the future design of cities.

- Recognising 'urban green' as more than an aesthetic consideration
- Making landscapes work harder through a multi-functional design approach
- Designing creatively to deliver a green city ecosystem
- Utilising advances in technology to measure the value nature delivers through ecosystem services
- Maintaining an integrated approach to delivery that better links and connects policy

Workshop Resources

Cities Alive Card Set



100 issues shaping future cities,
20 each in these 5 arenas:

- Social
- Technological
- Economic
- Environmental
- Political

<http://www.driversofchange.com/projects/cities-alive-cards/>

Workshop Resources

foresight

Cities Alive

Rethinking green infrastructure

ARUP



Introduction

"Could an approach to planning and development that recognises the social, environmental and economic value of green infrastructure not only increase access to public green space, but help make urban areas more resilient to climate change?"

—TONY JUNIPER, "WHAT HAS NATURE EVER DONE FOR US?" (2013)

Cities need to be celebrated — through the centuries they have been vitally important in the development of mankind as centres of commerce, culture and learning. It is within the urban fabric where the greatest human advancements and changes in technology have occurred. It is vital that our cities continue to strive to be places of wonderment and centres of excellence against future challenges.

Only over the last 200 years has mass urbanisation really occurred, and as recently as 2007, for the first time in human history, the majority of people lived in towns and cities. With this continuing shift to urban living, cities are facing far greater social, economic and environmental pressures. From New York to Shanghai, our drastically different cities must all ultimately confront the same issues of climate change, scarcity of resources, environmental degradation, pollution and dangers to human health. A lack of response to these pressures, or business as usual, will have dire

consequences. Can we rise to the challenge to make our cities life-enhancing communities of discovery, creativity and innovation that are safe and healthy for humans and ecology?

Urban spaces are inextricably linked to the environment of our planet and there is a compelling case for building new cities and retrofitting or expanding existing ones in ways that work in harmony with nature, by linking ecological and human systems. The city can become an ecosystem that embeds nature and people as equal partners to help rebalance growing urbanisation. The objective is to achieve a city that works in equilibrium and balance with nature, rather than against it, to address the current excesses of urban living. Ultimately cities must answer to the problems of keeping their citizens, happy, healthy and fulfilled in order to continue their important role in human development.

At present, most cities woefully fail to achieve any sort of balance between people and nature. As pressure has grown

Sustainable new build: Hammarby Sjöstad is Stockholm's largest urban construction project. The "Hammarby model" has become a tool for environmentally friendly city development around the world. When completed in 2017, 26,000 people will be living here in 11,500 apartments. The district has been planned using an eco-cycle approach and is intended to showcase ecological and environmentally sensitive construction and living.

Arup

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[Cities Alive Download](#)

Workshop Resources

How to use the Cities Alive Workshop Cards

<p>Trends and Implications</p> <p>Workshop participants are grouped into teams; each team is assigned one STEEP category. The teams are asked to choose five key issues from that category driving change in their city, and to explore future possible implications.</p>	<p>Future News</p> <p>Using the card set for inspiration, workshop participants create a set of five future newspaper headlines representing city-related news and events. As premise, participants are given a topic of particular relevance to the focus city.</p>	<p>Design Charrettes</p> <p>Workshop participants are grouped into teams. The facilitator acts as a 'client' and randomly selects five cards for each team. These cards are used as inspiration and constraints during design development for an urban area or set of city systems.</p>
<p>Potential Outcomes:</p> <p>Better understanding of issues shaping the city ecosystem.</p> <p>This exercise is particularly useful for identifying current friction points and methods for enhancing city vitality.</p>	<p>Potential Outcomes:</p> <p>Revealing insights about how urban issues may play out over time.</p> <p>This exercise is particularly useful for detecting and shaping emerging contexts and trends.</p>	<p>Potential Outcomes:</p> <p>Innovative design ideas that promote sustainable urban planning.</p> <p>This exercise is particularly useful for reevaluating and developing existing strategic plans.</p>

Our Choice:
Design Charrette format

Design Charrette

It's 2050!

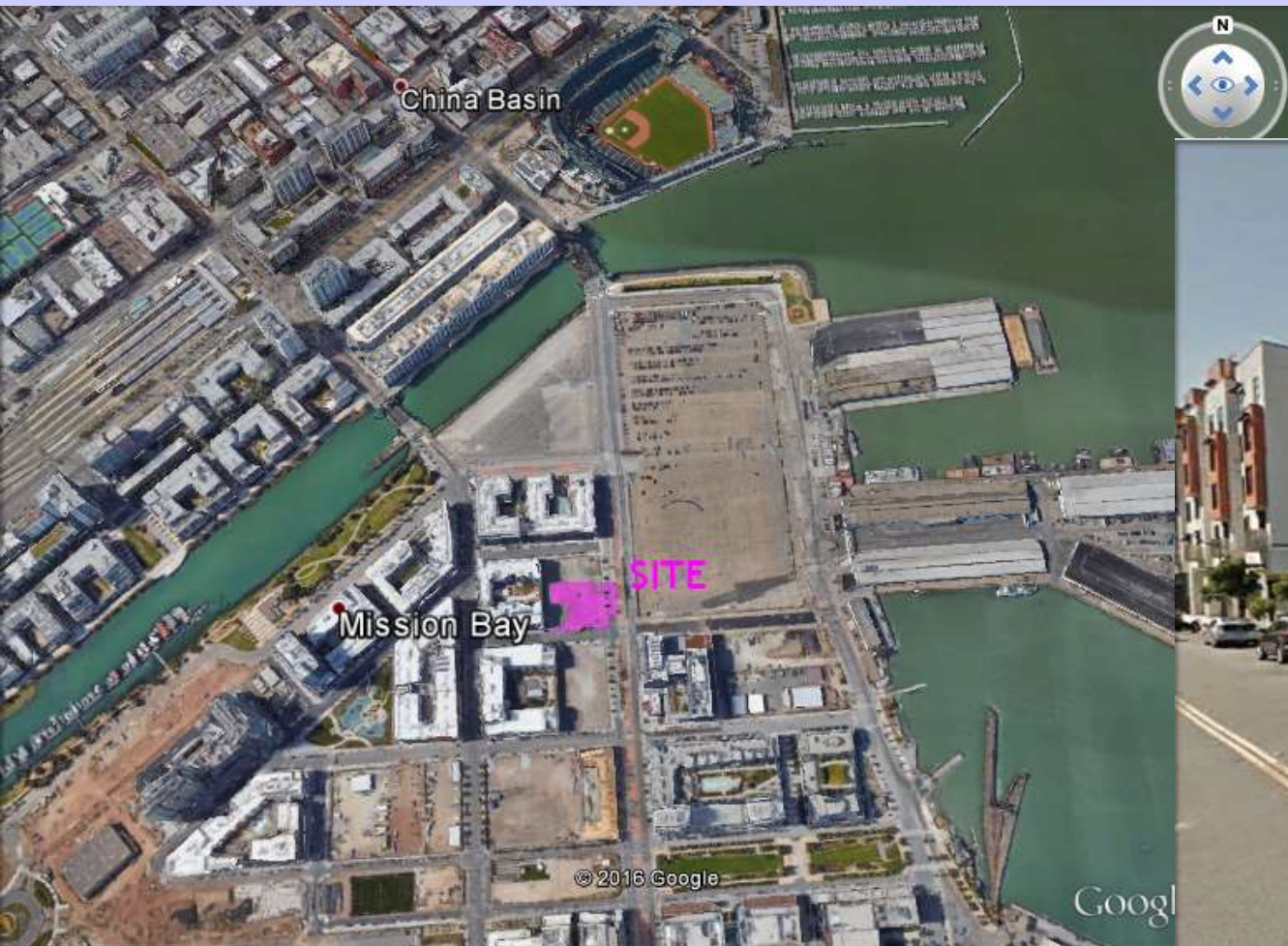
The integrated architecture, engineering and interior design firm of Dewey, SaveSome, and Howe has hired your team to **set design goals** for a new studio in San Francisco.

They project the 20,000 sqft building to be composed of an administrative area (1,160 sqft), principals offices (1,550 sqft), architecture staff (2,545 sqft), engineering staff (2,045 sqft), interiors staff (1,545 sqft), support areas (1,150 sqft), and education center (3,800 sqft).



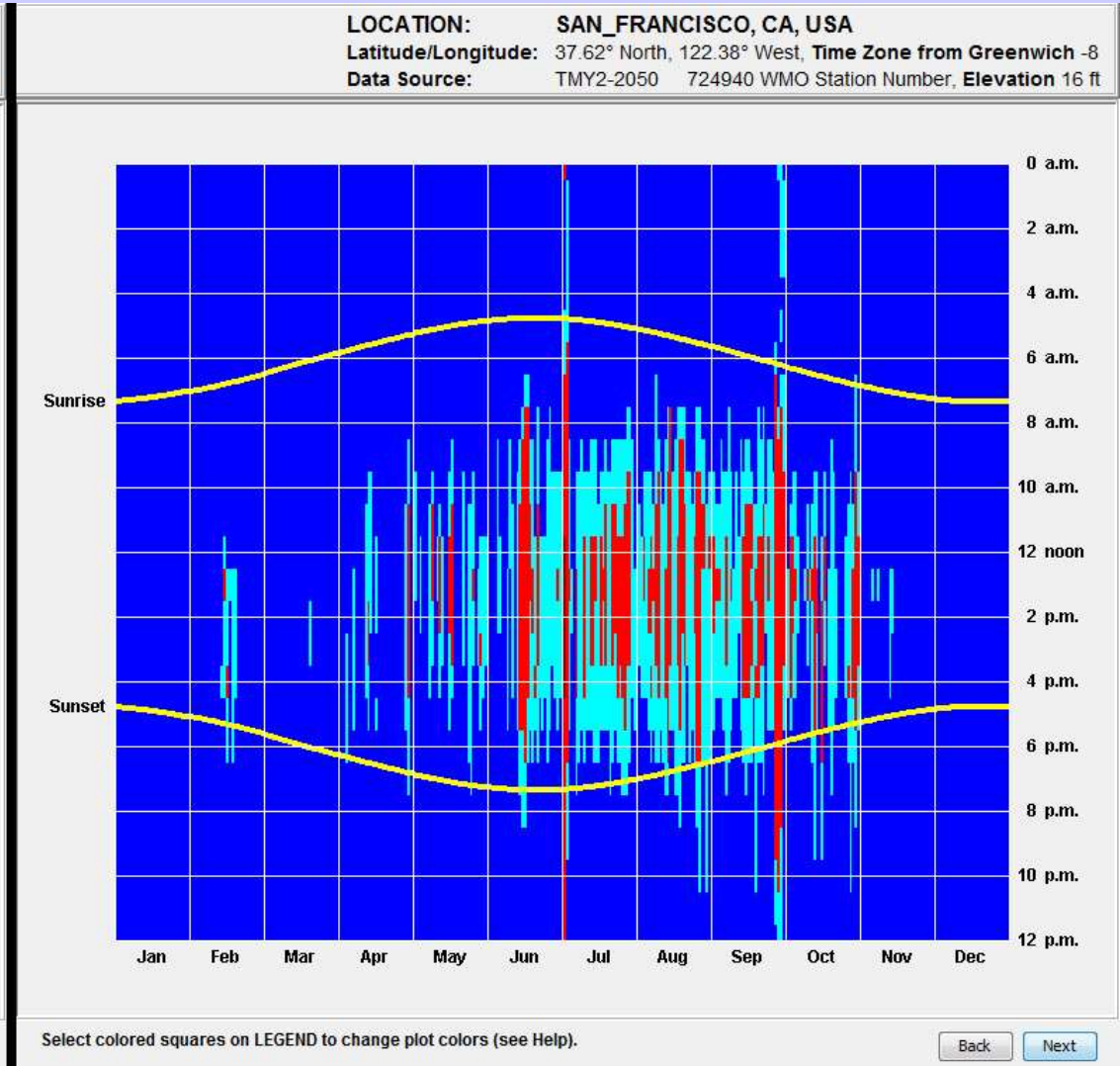
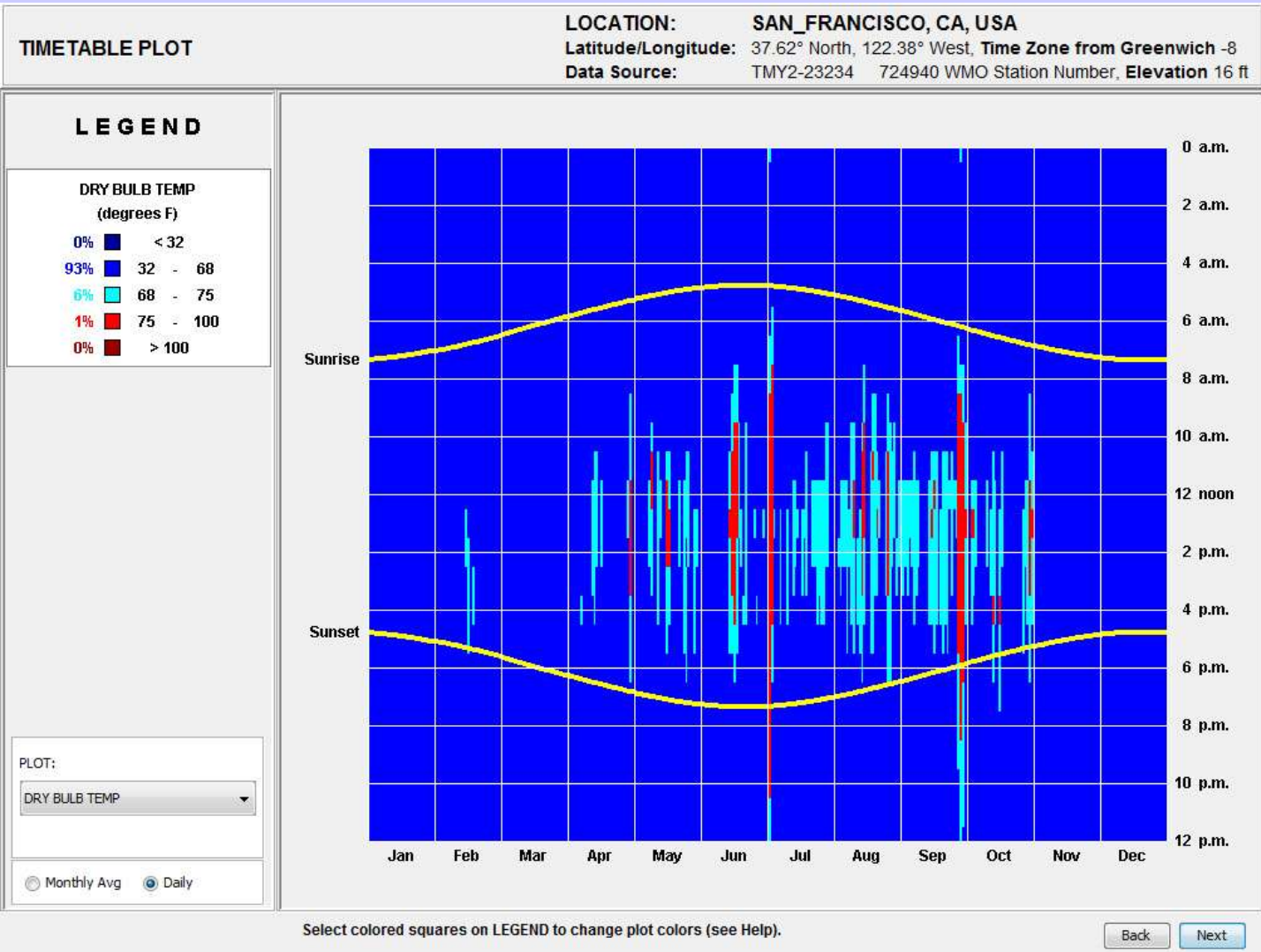
The 2,000 square meter Environmental Building at BRE by Fielden-Clegg (south façade, north façade, interior)

Design Charrette



The site is a vacant corner parking (Lot C above-view from SE). The site dimensions are 75'-0" x 135'-0" (10,125 sqft) with the long direction running almost due east and west.

Design Charrette



SF Climate today vs. SF Climate 2050

Design Charrette


Deliverables:

No more than 5 design goals for the 2050 office building.


Our building heating and cooling is controlled by the main system, and will attenuate to perfection to provide a stable and comfortable environment for the users.

We foresee Passive strategies synthesizing with active strategies to become one concept, controlled by the Smart system.


Heating & Cooling



Lighting




Smart System



All of the variables in our building will be controlled by a mainframe, which will use processes to change internal factors and external factors in real time.

Water Storage




We are going to use rain water to provide "Grey water" needs as applicable. Water will be stored in a tank in the basement of the Gallery, which will store 6,000 gallons of water at any given time.

- Our total roof area is calculated by $120 \times 40 = 9600 \text{ sf}$.
- The cistern size was determined as $10' \times 10' \times 8'$ in cubic feet, with a capacity of 5,984 gallons.
- Excess water would be used to water planters via gutters or sent to the city system.

We predict that in the future, it'll be common that lighting sensitivity will be increased and fine-tuned by sensors to respond in real time to daylight levels and occupancy, removing the need for continued adjusting.

Lighting




Solar Power

We've implemented 32 kilowatt solar panels. We can hypothetically produce 1,227,480 kilowatts per year.


$153,435$ (Current production by PVwatts)
 $x2 = 306,870$ $x2 = 613,740$ $x2 = 1,227,480$.

Any energy that is not needed will be sent to the city power grid to aid in City-Wide energetic deficiencies.


PRECEDENT STUDY: THE CRYSTAL




NATURAL LIGHT




SUSTAINABLE TRANSPORT




WATER



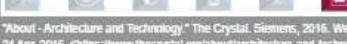
ELECTRICITY



HEATING & COOLING



SMART BUILDING



"About - Architecture and Technology" The Crystal. Siemens, 2016. Web. 24 Apr. 2016. <<https://www.thecrystal.org/about/architecture-and-technology/>>

Spring 2016 Studio Project
Ben Millick & Bryan Serrano

Go Plan for the Future!



Spring 2016 Studio Project Drew Gilbert & Landon Friesz