

Beta Bridge: Infrastructural Symbiosis

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The Beta-bridge proposes a radical reinvention and reuse of the soon to be demolished eastern span of the existing Bay Bridge. Beta-bridge will transform from a single-use to a multi-objective, multi-functional infrastructure. It will generate energy from the sun and wind, It will capture water from fog and rain. The lower deck of the existing bridge will house data farms, serving the bay area and local tech industries. The upper deck will become laboratories and greenhouses for medicinal cannabis. These two industries will exist in metabolic symbiosis, sharing energy, heat, power and water. The bridge will provide 1.6 billion annual USD which will be used to supplement the retrofit and rebuild California's transportation infrastructures.

The data center (server farm) is the physical infrastructure that stitches together the seamless world of the internet. Often unnoticed, these facilities have been rapidly proliferating in our cities and regions. Known for their excessive energy appetite and production of waste heat, data centers have the largest carbon footprint of any building found in the city. The challenge for designers is to imagine opportunities to enlist the data center as a productive force, participating in a hybrid development scheme of diverse urban programs that harvests its own waste energy. These "permacultural" data centers, thus, become codependent with the physical city, rather than autonomous with the virtual.

In the wake of the damage caused by the Loma Prieta earthquake in October 1989, numerous retrofit strategies were developed for the Eastern Span of the Bay Bridge, each of which had to incorporate a careful staging of construction activities in order to allow continuous vehicular access and use of the structure. This greatly increased the cost of the retrofit of this span. Once the new eastern span is complete, the old bridge can be retrofitted during normal business hours with an appropriately sized crew, thereby affording greater efficiencies, a greatly reduced overall schedule, and the savings of several hundred million dollars.

