

BORDER FUSION/

**FUSIÓN EN LA
FRONTERA**

Integrating Industry, Habitation and Exchange in a Divided City

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Submitted to the Department of Architecture and the Department of Urban Studies & Planning in partial fulfillment of the requirements for the degrees of

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FUSIÓN EN LA FRONTERA

ABSTRACT

THESIS SUPERVISORS

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The urban fabric of communities along San Diego/Tijuana's *la Línea* or border wall are characterized by high degrees of spatial fragmentation: -- a condition typical of border interface areas in politically partitioned or divided cities. Despite being centrally located relative to population and activity centers and their economic and social importance as sites for border crossings, these communities are sites of contention which have tended to attract a mixture of conventionally undesirable development programs. The critical interface connecting the US and Mexican halves of the city is, in substantial measure, a "no-man's-land."

This thesis considers one such border community, San Diego's Otay Mesa district, and proposes a long-term urban design strategy for its transformation into mixed-use neighborhoods with the border wall itself as a key activating and organizing spatial element. What is a physical expression of urban form in Otay Mesa that simultaneously accommodates frequently conflicting national, local and environmental objectives for the site? How may man-made infrastructures and natural site systems be exploited, restructured and interlaced to facilitate the redevelopment of the site? What design interventions will improve the physical and social connections between San Diego and Tijuana, and support these connections by developing a new activity center at Otay Mesa? What will life be like in the neighborhoods that will emerge from this redevelopment? The proposed strategy takes the form of an integrated urban and landscape design and programming framework developed to achieve and supplement planning objectives for the site while overcoming proximity-related land-use incompatibilities. Extant urban systems, including hydrology, landscape, transportation and security, are restructured as interdependent physical systems, which, in interaction, may be deployed to generate a matrix of urban neighborhoods for habitation, employment, recreation and cross-border economic and cultural exchange.

Specific proposals advanced include: (i) the development of an exchange-oriented mixed-use commercial center at the proposed Otay Mesa East border crossing; (ii) the transformation of the border wall into a garden and hydrologic feature linked into the district's developed fields, its ecology and landscape features; and (iii) reorganized infrastructural systems to mitigate heavy truck traffic.

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JULY 12 2007

Integrating Industry,
Habitation and Exchange
in a Divided City

Massachusetts Institute of Technology
Joint Program in City Design & Development
School of Architecture + Planning

VISION PLAN

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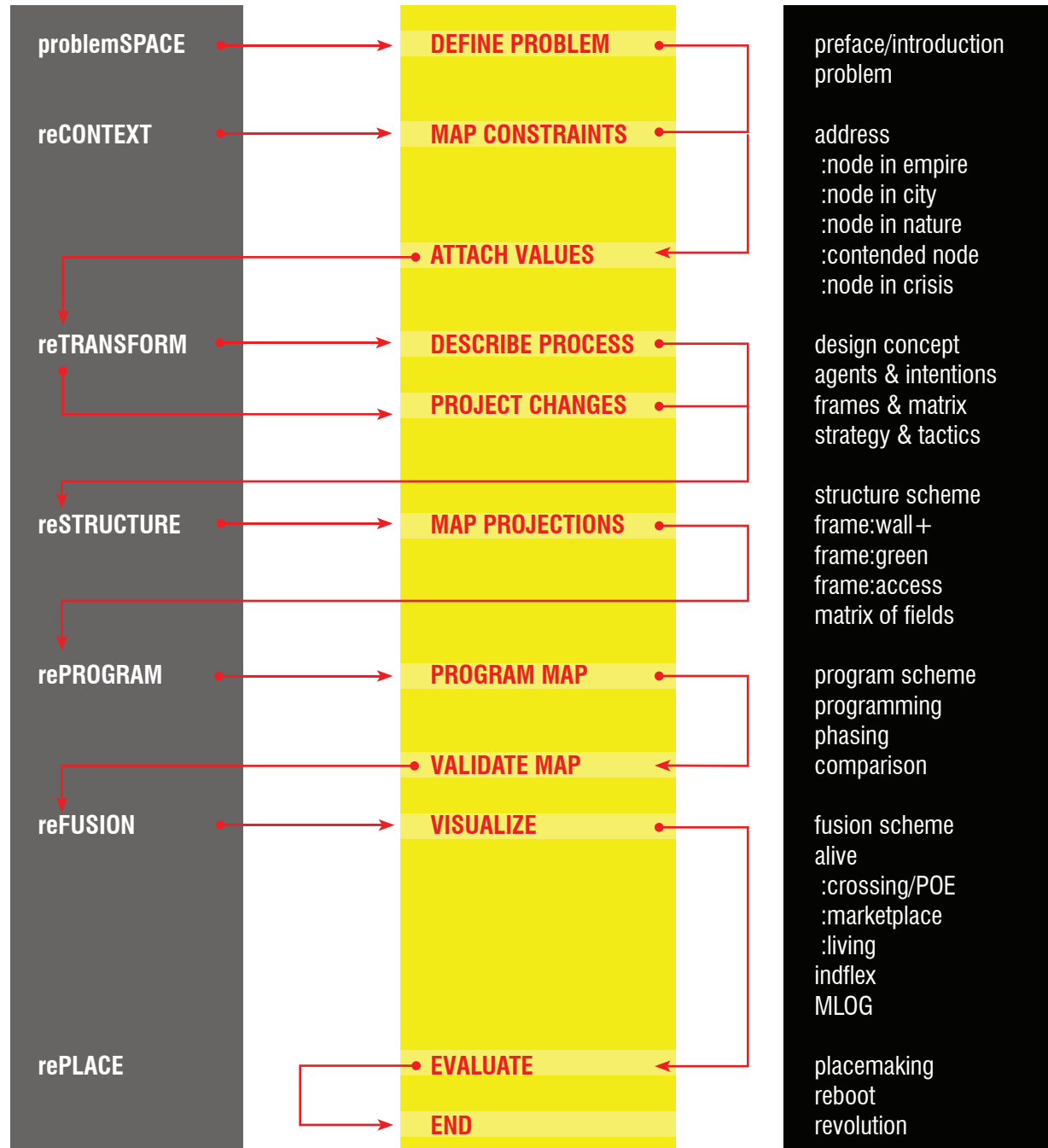
I dedicate this study to the people of San Diego/Tijuana. May we overcome our fears and move to heal and transform our city.


Albert S Wei
SAN DIEGO, JULY 2007

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SCHEME





John Thakara
*Living in Bubble:
Designing in a Complex World*

“Architecture, urbanism and regional planning are merging together as a continuous field which is as complex as it seems disconnected from everyday life. Rather than the producer of elegant stand-alone, three dimensional products, architects are being asked to reposition themselves as programmers of ongoing spatial and systemic change.. active notations of city geographies and economies, with currents, flows, rhythms, exchanges, transactions, forms of connectedness.”

José Manuel Valenzuela Arce
quoted in
*Extraño Nuevo Mundo:
Arte y Diseño desde Tijuana*

“La tercera nación enfatiza los rasgos culturales distintivos de la ciudad definidos desde los procesos de hibridación cultural, pero construida como un palimpsesto... El palimpsesto de la tercera nación utiliza fragmentos de obras, ampliaciones en lonas, realiza pastiches con trabajos de diferentes artistas, resignifica los espacios, transporta el muro a otros lugares, crea proyectos germinales con transiciones sin destino.”

problemSPACE

preface/introduction

problem

PREFACE

To grow up in San Diego/Tijuana is to live with a certain degree of dissonance. From within the complex horizontal fabric of pastel-colored buildings that characterizes many of its neighborhoods, one might be able to see, by simply turning one's head, smokestacks and shipyards, rift canyons, freeways, rolling grasslands, thousand-meter mountains and, of course, some of the bluest ocean in the world. At certain times of the year one can, within, say, three quarters of an hour, drive through a mountain snowstorm and play volleyball on the beach. I like to call it unity in contrast, or in division.

I cannot tell you when I first became aware, or at what level I was aware, that this dissonance extends beyond the landscape -- that my city is divided in a darker way, and not just by *la Línea de demarcación*, the line that separates Mexico and the United States. The sense of division extends to the perception of contrast between the non-physical idea of separate yet simultaneously existing *Anglo* and *Latino* cities or social-cultural spheres, indelibly intertwined, yet separated, within the same volume of space (as opposed to a divi-

sion between *American* and *Mexican* people or between those living on respective sides of the physical borderline). Division here is intangible, undefinable, uncomfortable and integrally ubiquitous. In this context, division is insidiously normal, and its markers are myriad and manifest. I can recall a few of them from my youth: -- the jobs our parents held; the clothes we wore; the food we ate and the times at which we ate it; the customs and celebrations of our day-to-day lives; the jokes and words with which we demeaned each other; the languages in which we spoke those words or the accents we used in speaking them; the neighborhoods where we lived; and the shapes and colors of the buildings in those neighborhoods. And, of course, there were the threats we made, always like cowards, never to the faces of our intended victims but rather safely among those of our own kind, and then there was the fear we had -- whether of crime, difference, discrimination, police oppression, class insecurity, falling property values or just of losing oneself -- and on whom that fear was blamed. More commonly, there was the violence of unspoken threats and intangible fear. All of these things shaped our perceptions, our sense of worth.

Division was not simply about color or faith or money. One could be brown, yellow or white; Catholic, Protestant or Jewish; rich or poor; Mexican or American; San Diegan or Tijuanaense. Those labels gave substance to our sense of division, and, more often than not, we failed to handle these differences with sufficient maturity, integrity or empathy. But these differences are, in the context of the city, complicated by an uncertain combination of place, culture and history, or rather, place *in* culture and history. Unless one is a member of the Kumayaay Nation, our division is not about the usual Western Hemisphere script of majorities and minorities, immigrants and natives. Rather, by an accident of geopolitics -- the terms of a long-ago cease fire, that became a treaty dictated at the point of a gun, that was, in turn, partially undone by a mapping error -- different groups were brought together at the place that would one day become their city, and they, their descendants and those who arrived subsequently to join them, were required forevermore to share it. At some semi-conscious level, the awareness that we are plural in a single place -- does not sit easily.

And so some of us applauded when,

in the early 1990s, Federal officials we had scarcely ever seen decreed the construction of what for us would become the physical manifestation of our social-cultural division: from panels of corrugated steel -- the surplus of some faraway war -- would be built a wall, following the course of *la Línea*, approximately five meters in height and 22.5-kilometers in length, from the mountains to the sea.

Never mind that the people -- *Anglo* and *Latino* -- who would be divided by the wall already lived and worked on both sides of it; never mind that wetlands, rivers, forests and even mountains in one of the world's biodiversity hot spots, would have to be moved or destroyed; never mind that it would cause floods and landslides that would wipe out homes, lives and habitats; never mind that the military engineers commissioned to build it said that the design was unbuildable; never mind that the wall only worked as a symbol -- one could easily just walk or swim around it at either end -- it must be built for the defense of someone's idea of what a homeland ought to be.

And when the wall failed to accomplish whatever shifting purpose was attached to it by whichever national

politician needed to win an election, they ordered that it be made stronger, higher and, eventually, multiple -- two or sometimes three parallel fences with exclusion zones between them, to make it easier for the floodlights to expose potential enemies. And they sent police, dogs, helicopter gunships, unmanned combat drones and soldiers, to secure it against what or whom was never quite made clear:-- reasons given have, over time, included "epic lawlessness,"¹ narcotics trafficking, armed gangs, terrorists, "illegal aliens," unauthorized dumping, petroleum smuggling, loss of cultural identity, loss of racial purity, loss of jobs, and, curiously, tax increases necessitated by public school over-enrollment.

Regardless of their reasons for building it, the wall, which is euphemistically called a "fence" in Washington,

1 "Epic lawlessness has characterized that border for 150 years...burdens our social services, harms employment prospects, lowers wages for tens of thousands of American workers, and brings crime and disorder to communities... threatens our national security," 'Border Czar' US Special Representative Alan Bersin, a Federal operative sent to San Diego to oversee construction of the first wall, in a report to the US Congress, April 23 1997.

DC, became a tangible monument to our divisions, and, within a short period of time, it began to shape the city's form. The ecologically complex wetlands at the Tijuana River estuary became silted and are now partially paved over with security infrastructure. Uphill from those wetlands, snuggled between the urban border neighborhood of San Ysidro and the mountains, the grassland plateau of Otay Mesa hosts the upper segment of the wall. It soon became a place from which San Diego started to retreat from the border it shares with Tijuana,² even as Tijuana continued its custom of sprawling eastward using the border as its structural guide. In the wake of this retreat came all manner of urban programs no other part of the city would accept:-- toxic waste storage sites, landfills, container lots, automobile and equipment graveyards, prisons, and Homeland Security detention centers. And there are kilometer after kilometer of grimly designed factories and warehouses, which while unwanted elsewhere, also point to the promise of cross-border commercial integration. Functionally, Otay Mesa became a place of flight and pursuit,

² Local architect Teddy Cruz of UCSD suggested the metaphor of San Diego fleeing north as Tijuana pursues it by crashing against the wall.

of floodlights and helicopter patrols, shots in the dark, and for plans for future prosperity and coexistence based on brick-and-mortar industries. In short, Otay Mesa and its wall became the formal embodiment of San Diego/Tijuana's dissonance:-- a buffer zone into which we could deposit, or at least hold in uneasy abeyance, our fears and hopes.

But this buffer is, itself, a lie, as is the wall that bounds it. As stated before the real divisions are not physical or geographic. What one Federal official saw as "epic lawlessness" is actually a single functioning city, whose neighborhoods are divided by a line, marked by a wall that has, in turn, become a central organizing feature. Tijuana and San Diego share ecologies, economies, housing markets, industrial supply chains, power and water, and even a common sewage treatment system. The freight rail lines that link the dual city's industries with the rest of the continent weave back and forth across the border. A savvy socialite of the city's cultural elite is now nearly as likely to be found at an exhibition opening at the Zona Rio's CECUT as at a charity ball in Centre City's Westgate Hotel. Many neighborhoods north of the barrier are as Mexican in charac-

ter as those south of it, and colonies of *gringos* dominate subdivisions on Rosarito Beach. Tijuana's factory bosses are homebuyers in the Marina District's most exclusive buildings, and builders of residential towers in the Zona Centro are welcoming rent refugees from among San Diego's young professionals. The Tijuana Playas are morphologically indistinguishable from Pacific Beach. San Diegans buy their groceries in Tijuana's big box stores, and few San Diego shopping malls could survive without Tijuana housewives. The dream of autarchy is a delusion.

This thesis investigates how urban design may be used to stage an intervention to halt San Diego's instinctive flight from Tijuana. I propose to hold San Diego's line of retreat at Otay Mesa, leveraging the physical elements that make it an alienating place today: -- its empty spaces, its unadorned industries and the wall itself -- as assets in this action. In doing so, I propose to appropriate the wall, the physical symbol of our division, to undermine the very idea of it, in the hope that we can create a hybrid place from which the dual city can grow more comfortably into a shared, less divided, future.

INTRODUCTION

There is something of a cottage industry in the field of urban design for the restoration and re-urbanization of city districts with physical fabrics damaged by social or political conflict. This damage may take the form of “no-man’s lands” and border wall conditions at or around geographic fracture points. Rem Koolhaas’ “Check Point Charlie” project in Berlin, with its investigation of the “rituals” of city division as embodied in form, is one case in point (*e.g.*, Koolhaas, 1998). Other popular targets include Belfast, Jerusalem, Sarajevo and LA after the riots. San Diego/Tijuana³ increasingly figures in this

³ Throughout this manuscript, “San Diego/Tijuana” or the “city” is used to refer to the San Diego/Tijuana metropolitan area, and is taken to include the US municipalities and outlying areas grouped into the San Diego metropolitan statistical area by the US Census Bureau and the Mexican *municipios* and outlying areas defined as part of the Tijuana *zona metropolitana* by the Mexican population agency CONAPO. As of 2007, the estimated population of this conurbation is taken here to be 4.7 million. It is recognized that this figure is significantly lower than most commonly accepted metropolitan population counts. Sources for this calculation are given at the end of the reCONTEXT chapter, but a detailed

discourse, perhaps since Koolhaas made an impassioned argument for its particular problems in *Mutations* (2001). Although, to be fair, local planners and designers probably noted the opportunity at least half-a-decade before a Pritzker Prize winner put the city on this particular design map.

In general, these projects require significant risk and correspondingly radical interventions which, in general, must be undertaken before the underlying political and social conditions which generated the physical dislocation are addressed. Often these social divisions, which may have little to do with the actual neighborhoods separated by the barrier in question, are far more intractable and problematic than the hard constructions themselves. Until these considerations are addressed, interven-

treatment of this, admittedly contentious, issue is outside of the scope of this writing. “San Diego” refers to the municipal City of San Diego, “San Diego County” refers to the unincorporated areas of the county, Tijuana refers to the *municipio* of the same name. SANDAG refers to the San Diego Association of Governments, a regional planning agency consisting of the municipalities on the US side of the border and Mexican municipalities as observers.

tion schemes may risk being seen as new oppressions by one side or another, or they may choose to confine themselves to pin-point and social/programmatic mitigations. Nonetheless, this thesis proposes to investigate, through design exploration, the prospect of restoring and re-urbanizing one such district adjacent to the border wall, at the interface between Tijuana and San Diego.

The San Diego/Tijuana Wall

Walls and “no-man’s lands” are a relatively recent development in San Diego/Tijuana. The two municipalities have comprised a dual city, with interdependent economies and cultural lives, since Tijuana was founded as a trading post destination for San Diegans in 1886 (*e.g.*, Herzog, 1999). Eventually, the two cities expanded until their neighborhood fabrics physically met at the international border between the US and Mexico, forming a more-or-less continuous urban fabric (see the historical growth diagrams in the reCONTEXT chapter). While the international border was important in determining the allocation of socioeconomic opportunities, *Anglo*, *Latino* and Asian neighborhoods existed on both sides of the border, from the late-19th century onward, and, with

a few exceptions, essentially open exchange occurred between them (Ford, 2005; Herzog, 1999).

Although a border crossing checkpoint existed as early as the 1920s, no wall or “no-man’s land” divided the cities until the US Federal government began to assert its authority in the region in the mid-1980s, culminating in 1993, with the appointment of a US Department of Justice Special Representative with a mandate to use military methods to harden and fortify the San Diego sector of the US frontier security system (*e.g.*, Nevins, 2001). As the first phase of a sweeping police and para-military crackdown called Operation Gatekeeper, military engineers constructed a 22.5-kilometer long steel wall, from the foothills east of San Diego to the Pacific Ocean, using surplus materials from the first Iraqi War (Nevins, 2001; Herzog, 1999).

The wall was expanded under both Presidents Bush and Clinton, and is now called the Border Infrastructure System (“BIS”):-- a part of an ever-expanding security apparatus that includes armed checkpoints, floodlight towers, electronic sensor nets, exclusion zones, and an increasingly heavy presence of security person-

nel. Additional tiers of fencing were added - comprising what is commonly referred to now as the “triple fence” with more tiers and exclusion zones for floodlights, foot and vehicle patrols. Beginning in 2003, a number of state government and citizens’ environmental groups attempted to place limits on the accelerating pace of new security construction, resulting in legal and administrative challenges to the Federal government.⁴ As a result of these assertions of local interests, in 2005 US officials invoked emergency powers for the San Diego sector that authorized the suspension of relevant laws, codes, environmental standards and rights of judicial redress in the name of national security.⁵

4 *e.g.*, California Coastal Commission (2003), consistency determination CD-063-03, July 23.

5 *e.g.*, Department of Homeland Security (2005), “Determination Pursuant to Section 102 of the Illegal Immigration Reform and Immigrant Responsibility Act of 1996 as Amended by Section 102 of the Real ID Act of 2005” in 70 *Federal Register* 55622-02, September 22; also, US Congress, Congressional Research Service RS22026 and RL33659, which investigated the Federal assertion of emergency powers; the latter two reports contain a detailed history of San Diego border security measures and an architectural description of the BIS.

Otay Mesa as Product of the Wall

Construction of the BIS, and militarization of the neighborhoods to the north of it, corresponded with rapid urbanization on both sides of the borderline, with development on the US side heavily influenced by the presence of the security infrastructures. This has particularly been the case in the Otay Mesa district,⁶ the subject of this investigation. The interface between San Diego and Tijuana extends for the entire length of the BIS and comprises three distinct districts on the US side: (i) by the sea, the Tijuana River Estuary, a wetlands preserve; (ii) the San Ysidro neighborhood, which includes a major Port of Entry (“POE”), or border crossing

⁶ “Otay Mesa” or the “*mesa*” refers to the site, as shown in various maps contained in this manuscript, and which corresponds only roughly to the US side of the planning area of SANDAG’s 2005 draft *Plan Estratégico del Corredor Binacional Otay Mesa – Mesa de Otay*, including sub-areas within the City of San Diego and the County of San Diego. Generally speaking, the site boundaries correspond to the US side of the Otay Mesa geological unit, excluding the area to the east of Johnson Canyon. “Mesa de Otay” (actually the same name) is used to refer to an area that comprises the continuation of that geological unit south of the border, the southern boundary of which is the Alamar River Valley.

between the US and Mexico; and (iii) Otay Mesa, a fairly flat plateau, the floor elevation of which averages some one to two hundred meters above San Ysidro. As San Ysidro is largely built-out as a medium-density residential and commercial neighborhood, most new urbanization has occurred on Otay Mesa, which was not opened for development until after the construction of a second POE there in 1985.

Otay Mesa can be said to embody the irony of the San Diego/Tijuana interface:-- on the one hand, the BIS and the ubiquitous police and military presence are designed to deter visitors and urban activity. On the other hand, the presence of permeabilities in the BIS, such as the POEs, create opportunities for exchange that attract a vast quantity of visitors and generate large-scale urban activity. The district, which extends 10.5km east-west/4.5km north-south with roughly 3,500 buildable hectares, has developed a physical form that reflects this irony.

Otay Mesa as Urban District

Otay Mesa today serves a dual function as the transloading/logistics center for the city’s *maquiladoras* electronics, automotive and diver-

sified manufacturing sector, and as a general industrial, warehousing and manufacturing area. The POE itself has developed into one of North America’s most important land-freight ports, for trucks and containers carrying goods moving into and out of the US. Additionally, thousands of passenger vehicles and pedestrians use the POE to cross the border daily.

Despite this intensity of activity, no commercial center exists, and the urban activity has a distinctly “pass-through” feel to it. A small number of strip-mall-like structures provide services and lodging for millions of POE users, and these facilities, such as they are, are dwarfed by the infrastructure works and impervious surfaces that surround them. On the Mexican side, hundreds of *ad hoc tianguis* (informal open air markets) densely arrayed over a few kilometers, sandwiched between factories and residential neighborhoods, provide goods and services to bordercrossers. Development programs which occupy the preponderance of the site include:-- (i) walls and the POE customs checkpoints required by the state security apparatus; (ii) globalized trade and production facilities, including logistics establish-

ments, *maquiladoras*-related and general industrial plants and associated transportation, parking, and container yards⁷; (iii) minimal housing for workers in these facilities; and (iv) other facilities deemed inappropriate for more desirable districts, such as waste disposal, landfills, *yonkes* (automobile and equipment graveyards), prisons and a Department of Homeland Security detention center.

Tijuana neighborhoods like Ejido Chilpancingo and Las Torres, come right up to the BIS, while San Diego appears to pull back from it, leaving behind it a “no-man’s land” reserved for the urban detritus of unwanted and unpopular programs, security functions, and the barest, and most utilitarian, possible form of industrial development⁸.

7 Over the last 15 or so years 1.2 million square meters (13.2 million square feet) in leasable industrial real estate has been constructed and occupied on the *mesa*, Grubb & Ellis Research (2007), *Industrial Market Trends San Diego*, Second Quarter.

8 Teddy Cruz characterizes this “no-man’s land” in the following way: “a scarred landscape inhabited only by an army of... paramilitary operations.” He argues that, in this context, only the wall is permanent, with everything else com-

Otay Mesa’s form contrasts markedly with the situation at the other POE, between the neighborhoods of San Ysidro and Zona Norte, to the west of the site, which developed before the BIS. There, on both sides of the border, comparatively dynamic transit and pedestrian-oriented communities host a rich and colorful array of planned and unplanned round-the-clock activity in developed blocks (Cruz, 2002). Instead of *tianguis* and insubstantial strip malls, commercial activities in the compactly scaled neighborhoods are concentrated in traditional buildings, in shopping arcades, and in a popular urban outlet mall. Here, the BIS was retrofitted on seized land and inserted between developed programs. The inserted wall segments create an uneasy visual contrast with their surroundings, but the communities on either side appear to have remained integral, simply shifting their spatial structure to accommodate the imposition.

prising “transient nomadic settlements with... buildings which act as scaffolds for change, infrastructures habitually transformed by the overlapping of transitory programs, avoiding rigid programmatic and typological envelopes in favor of multiplying their potential as stages for activity” (Cruz, 1999, 43).

Otay Mesa’s Future

For its part, SANDAG, and the City of San Diego recognize the importance of Otay Mesa, as (i) an economically vital node in global supply chains and therefore a local center for job growth, and (ii) as one of the last districts with substantial tracts of undeveloped land, in a metropolitan area desperately short of housing. It has thus initiated a planning process, ongoing as of this writing, that calls for at least 15,000 new housing units with 55,000 new residents *and* industrial space that will eventually host more than 43,000 new jobs (e.g., City of San Diego, 2006; SANDAG, 2006). But, to date, this planning process has not addressed the BIS and its impact on urban form. Nor has it addressed what manner of urban community, as opposed to merely a workshop and dormitory, it would like to see develop at Otay Mesa.

Beyond the BIS, the globalized economy, and the issues that arise from them, local decisionmakers must also address considerations of cultural diversity and the nature of form-making in an ethnically segregated but, perhaps, hybridizing city (Dear, 2003). Dear characterized San Diego/Tijuana as a “convergence

field” for hybridities, and nowhere is the more the case than Otay Mesa, whose workers, factory owners and managers, and POE users mirror the diversity of San Diego/Tijuana’s primary cultural groupings.

However, this notion of a city of divisions, hybridizing as they perhaps are, is not a simple one. As previously noted, the divisions are symbolized by the BIS, not reflected in the neighborhoods partitioned by it. The wall may be a symbol of division, but it actually divides nothing tangible:-- anybody it might conceivably keep out or in is already present on either side of it. Herzog (2003) argued that the fabric of San Diego and Tijuana, is, on either side of the wall, fractured into seven ecologies, which coexist uneasily:-- (i) global factory zones; (ii) transnational consumer spaces; (iii) global tourism districts; (iv) post-NAFTA neighborhoods (living zones for workers segregated by social class and ethnicity); (v) transnational community places that facilitate public gathering and “where trade and exchange are valued above defense and security;” (vi) spaces/neighborhoods of conflict, including the wall and its adjacencies; and (vii) “invented connections” where “opportunistic and transient” forms of

urbanism facilitate exchange.

In this context, one can argue that Otay Mesa today is, at once, a global factory zone, a space of conflict and, by virtue of the POE's presence, a place for informal and unintended exchange. San Diego plans for it to become, in parts, a global factory zone, a globalized consumer space and a post-NAFTA neighborhood. The Federal government seems to see it primarily as a field of conflict, best left to the security apparatus. Neither the present reality nor the articulated visions of two active agents -- the central government and the locality, each manoeuvring to arrange the district's future -- permit the *mesa* to become a place where coexistence and, ultimately, hybridization, of San Diego/Tijuana's internal divisions are facilitated. This is despite, or, perhaps, because of, its physical and symbolic position on the wall.

The Prisoner's Dilemma

One can argue that Otay Mesa's physical form today is the product of agents negotiating with each other through the process of building and developing land in proximity to one another:-- (i) the security-preoccupied Federal government, whose formal vision appears to be limited to

the BIS and the design of the POEs, and (ii) the locality, with its centrifugal collection of local governments, community groups and private-sector interests, which must negotiate around the BIS and their own apprehensions about the border "no-man's land" to build an urban neighborhood (and not merely a collection of parking lots and warehouses). This latter agent appears to lack, at present, a form-based vision of what might be the end result of their negotiation. The interaction of these two agents may very well be characterized as a type of asymmetric, non-cooperative, normal form game:-- local officials adjust their plans based on ever-changing directives about wall construction and real estate speculators (who are indifferent to an exit through permitted development or through forced sale to the central state) buy up parcels ahead of land-use decisions (Jackson, 2004). One might very well believe that the most likely outcome to this game will see both agents bound in a prisoners' dilemma. Barring intervention from a third, external agent, both parties likely will end up with a future Otay Mesa that simply exacerbates the stark realities of the present and their respective concerns about it:-- the Federal government will still perceive

a security risk and the locality will have to contend with more impervious surface without achieving any real urbanism.

That third agent, may, conceivably, be the environment and advocates for its conservation:-- a BIS that, increasingly, disrupts regional hydrology and destroys habitats (*e.g.*, California Coastal Commission CD-063-03, 2003); settlement patterns that have already strained the watershed and airshed to their respective breaking points (*e.g.*, Kopinak, Bajaras, 2002; Michel, 2000; Pezzoli, 2000; Sklair, 2000; others); a shortage of drinkable water (Walker, 2004); no less than eight Superfund sites⁹, and ever-increasing commutation times for workers and idling times for emission-generating trucks at the POEs (*e.g.*, Kazimi et al, 2006). Using SANDAG's conservative Otay Mesa land-use strategy, forecasted increases in population, employment and freight traffic may place unacceptable strains on regional transportation and social services resources, industrial waste handling capacity and, more critically, on sewage and water resources. Resource imposed 9 US Environmental Protection Agency (2007), Region 9 Superfund Site database: <http://www.epa.gov/region09/waste/sfund/superfundsites.html>.

constraints may change the rules and outcomes of the game.

Urban form in Otay Mesa emerges out of interactions between the central government, the locality and the environment, but the mechanisms of that interaction may lack the capacity to achieve a result any of these agents would find acceptable. This thesis seeks to better characterize what an outcome acceptable to all of the active agents might entail and to propose an urban design vision plan for achieving that outcome.

STATEMENT OF PROBLEM

This thesis proposes to challenge the *status quo* at Otay Mesa, by proposing an alternative long-term urban design strategy for its transformation. Extant urban systems, including hydrology, landscape, transportation and security, are studied, redefined and restructured as interdependent systems, using state-of-the-art technologies and creative design interventions, with the aim of redeveloping them into a composite infrastructural framework that will host an effective matrix for the development of livable and attractive neighborhoods.

These neighborhoods are recon-

ceived as multifunctional, culturally-inclusive and environmentally sustainable urban communities which may coexist with, instead of retreating from, the BIS. Thus restructured, Otay Mesa may become a district that more effectively addresses the requirements -- both implicit and explicit -- of the central state and of the locality, with appropriate consideration for environmental quality.

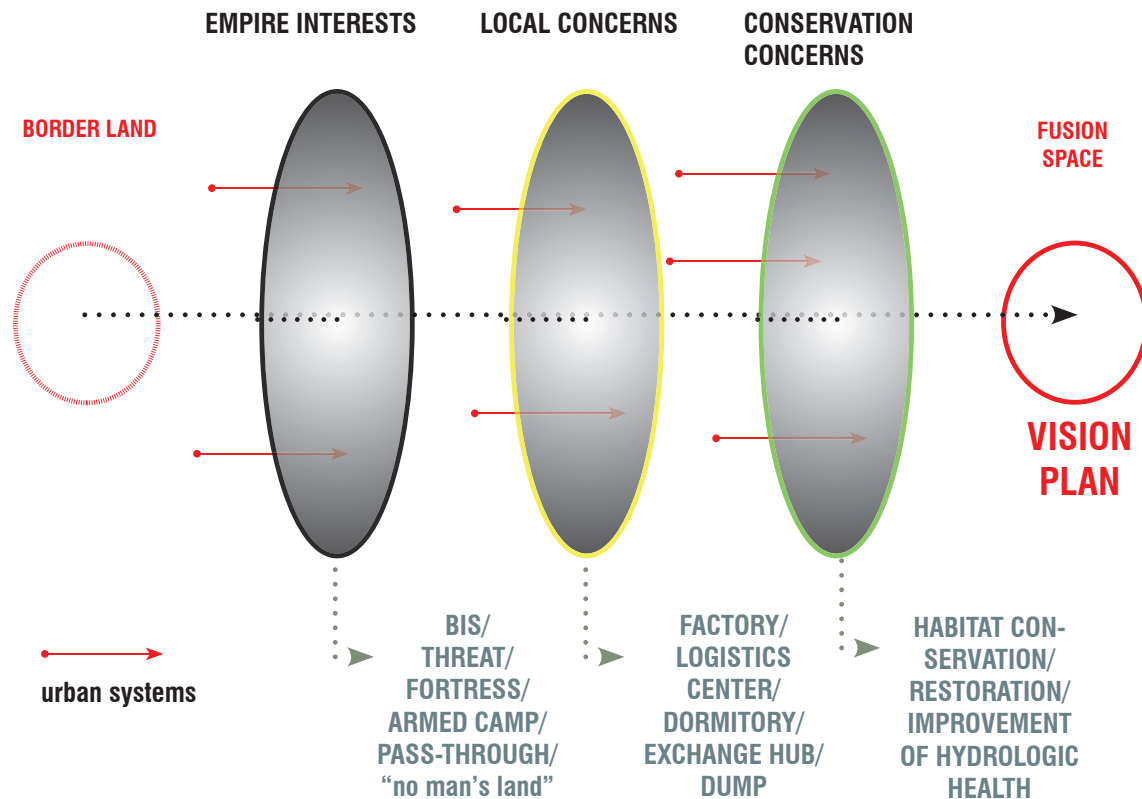
Existing site systems, including the BIS, are leveraged in these new infrastructural growth frameworks, rather than assumed away or eliminated¹⁰. Conservation and recycling of water resources, industrial by-products, travel times, energy expended in industrial supply chains, and existing buildings are also considered.

The “Conceptual map” on the right illustrates the relationship between urban systems and the three agents imposing requirements on the site; the likely, contradictory, outcomes of those requirements, if applied in isolation, are given at the bottom.

In summary, this investigation or “**vision plan**” seeks to address the following questions:--

¹⁰ The eventual retirement and closure of the Brown Field airport is assumed.

CONCEPTUAL MAP



1) What is a physical expression of urban form in Otay Mesa that simultaneously accommodates frequently conflicting national, local and environmental intentions for the site?

2) How may man-made infrastructures and natural site systems be

exploited, restructured and interlaced to facilitate the redevelopment of the site?

3) What design interventions will improve the physical and social connections between San Diego and Tijuana, and support these connec-

tions by developing a new activity center at Otay Mesa?

4) What will life be like in the neighborhoods that will emerge from this redevelopment?





reCONTEXT

address

:node in empire

:node in city

:node in nature

:contended node

:node in crisis

ADDRESS

Otay Mesa exists simultaneously as an urban node in three contexts:--

(i) **empire**: at the respective frontiers of the US and Mexico; at an important juncture in the global system of production, consumption and trade; and on a supply chain for electronics, automobiles and other products for the global market;

(ii) **city**: at the border interface between two large municipalities, San Diego and Tijuana, which, together, and counting their respective hinterlands, comprise the twenty-first largest metropolitan area in the Western Hemisphere¹, with an estimated 2007 population of 4.7 million²; and

(iii) **environment**: in a coastal sage scrub habitat range; on a sandstone/claystone plateau; and at a topographical highpoint between the Tijuana-Alamar River Watershed which covers 453,250 hectares, and the Otay River Watershed, which covers 41,440 hectares³.

1 World Gazetteer (2007), <http://worldgazetteer.com/>

2 CONAPO (2005), SANDAG (2006).

3 Project Clean Water (2007), <http://projectcleanwater.org>

This chapter investigates each context, and evaluates their implications for the site.

:NODE IN EMPIRE

In this investigation, “empire” refers simultaneously to two phenomena:-- the hard, traditional empires of nation states, in this case the United States and Mexico, and the fluid state space of post-industrial globalization, as that term is used by Hardt and Negri in *Empire* (2000). It may be argued that both senses of the term apply here. As Barber (1995) described it, the US, of which San Diego/Tijuana is a frontier node, is both a hard power, economically and militarily, and the dominant member in a network of “soft power” in the Hardt and Negri sense, economically, politically and socially. These two types of “empire” have frequently been in conflict on Otay Mesa.

Border City - Traditional Sense

If one was to maximize the distance from Washington DC and Mexico City to any single point within the respective continental borders of the US and Mexico, one would arrive at San Diego/Tijuana.

In many respects, San Diego/Tijuana

is a frontier city in the old, hard sense of “empire.” Many decisions affecting the lives of the people who live there are made by distal agents:-- few major companies are based there; large tracts of land and infrastructure are directly administered by their respective central governments; and San Diego contains a large military garrison. Both of them receive large numbers of in-migrants:-- people who come in search of jobs, educational opportunities, better weather or just to escape from their respective national heartlands. Many in-migrants come to Tijuana in order to facilitate their immigration to the US. Both have ethnic mixes, cultures and resident lifestyles that are heavily influenced by the other. And both of them have attracted heavy-handed responses from their respective governments when they have been perceived to host threats to the safety of their respective states⁴.

Production Node - New Sense

Despite its status as a frontier city in the traditional sense of “empire,” San Diego/Tijuana plays a reasonably important role as a production node in

⁴ *e.g.*, the afore referenced Operation Gatekeeper for San Diego; Luis Perez (2007), “Mexico Sends in Army to Retake Tijuana,” *Chicago-Sun Times*, January 4 for Tijuana.

the globalized system of advanced capitalism:-- in the Hardt and Negri sense of “empire.” As King (2004) noted, concepts of core and periphery may, under some circumstances, become inverted, with cities that are peripheral from a political perspective having core or at least less peripheral status, from an economic perspective. These two roles have, however, proven to be a source of tension for the city.

Globalized Production in the City

Cities with active production bases need to cultivate and sustain the following urban conditions:-- (i) adequate space for manufacturers and their supporting services; (ii) infrastructure for the inward and outward transportation access required by these companies for their trade and employees; (iii) housing, services and transportation for a large base of skilled and affordable workers; and (iv) an attractive, dynamic urban environment, with a discernible and interesting identity, for the workers, their managers and, presumably, their customers.

San Diego/Tijuana has been able to offer most of these conditions, including a large complement of indus-

trial real estate⁵. On the whole, with some stalling in the late 1990s, San Diego/Tijuana has been on the receiving end of manufacturing capacity in the post-industrial restructuring of the global economy⁶, assisted by the presence of a high proportion of skilled, educated manufacturing and technology workers, the lack of an established union presence and relatively lower wages.

Important production sectors include consumer and office electronics, telecommunications equipment, automobiles, medical equipment, business services/foundry outsourcing, pharmaceuticals, capital equip-

⁵ San Diego/Tijuana has approximately 16.1 million m² of industrial space (Grubb & Ellis market reports, San Diego, 3Q 2006) and only 3.1 million m² in R&D space and 6.4 million in commercial office space. By comparison, Greater Boston, which has a comparable population of 4.6 million, provides 10.8 million m² in industrial space, with a stress on warehousing, 5.1 million m² in R&D space and 15.6 million m² in office space, emphasizing San Diego's dependence on manufacturing.

⁶ e.g., James Gerber, Jorge Carillo (2002), *Are Tijuana's and Mexicali's Maquiladora Plants Competitive? The Future of Manufacturing in Baja California*, briefing paper. San Diego, CA: Forum Fronterizo.

ment, biotech, semiconductors and recreational equipment. In the past, shipbuilding, avionics and defense manufacturing were also important, but these sectors have declined significantly in recent decades.

Two important sectors -- electronics and automotive manufacturing and assembly -- rely on the *maquiladoras* system of dual factories:-- plants in Tijuana provide relatively labor-intensive assembly and component fabrication, while twin plants in San Diego complete the manufacturing process using components shipped across the border. The finished goods are then shipped from San Diego to US markets or returned to Mexico, tax-free, for export to foreign markets.

Tijuana-based manufacturing is now centered on the Mexican side of the Otay Mesa district, where factories owned by multi-national corporations employ approximately 175,000 workers in over 4.1 million square meters of industrial space⁷:-- one of

⁷ Ayuntamiento de Tijuana, Instituto Municipal de Planeación (2006). Workers produce automobiles, consumer electronics and personal computers for employers like Toyota, Hyundai, Kojima, Sony, Sanyo and Gateway. A majority of television sets and pick-up trucks sold in the US are manufactured in Tijuana.

the most important industrial concentrations in North America. On the US side, plants are located in Otay Mesa and other industrial districts.

The local manufacturing sector has continued to expand in value, despite the emergence of China, India and other Asian countries as low-cost production locations and despite a sharp contraction in 1999 to 2002. Gerber and Carillo (2002) found, for example, that despite losing some 80,000 industrial jobs in less competitive *maquiladoras* sectors, most value-added jobs were retained and that the sector as a whole remained highly competitive. By 2004 the sector was firmly rebounding toward its pre-adjustment levels (e.g., Lindquist, 2004). Recently, a new trend has started to emerge in Tijuana, with the arrival locally of new automobile manufacturing and assembly plants, namely Toyota (2005) and, ironically, leading Chinese carmakers in 2006 and 2007. The reasons for the region's continued competitiveness as a production node for certain types of capital-intensive heavy industry are complex and outside of the scope of this writing, but it does appear to be based on factors that are unlikely to change for the foreseeable future, provided infrastructure and educa-

tional investments occur at a pace comparable to the region's principal Asian competitors (Gerber, Carillo, 2002; Curry, 2000; Erie, Nathan, 2000; others).

Otay Mesa's situation with respect seaports and other major trade infrastructures, is illustrated in the map on the following page.

Otay Mesa as Production Node

Local planners are intensely aware of the need for public investment in Otay Mesa and other such areas. Soden, Olmedo, McElroy (2004) argued that the US-Mexican border zone, when a recipient of adequate trade infrastructure investment, is a national competitive asset, combining readily available land with large pools of skilled, well-educated and relatively low-cost labor. Once developed, the border interface region, they argued, will enable the US to slow its rate of job loss to China, India and other developing countries. Erie (2003) addressed the infrastructure requirements for further industrialization of the San Diego/Tijuana region, concluding that state-supported investment in hard infrastructure could effectively catalyze an acceleration of growth in the region's manufacturing sector. He noted that industries like



electronics, which predominate in San Diego/Tijuana have extremely high rates of cargo generation, and concluded that the transition to technologically-oriented “next generation” industries does not obviate or reduce the need for development of heavy trade infrastructure. He wrote,

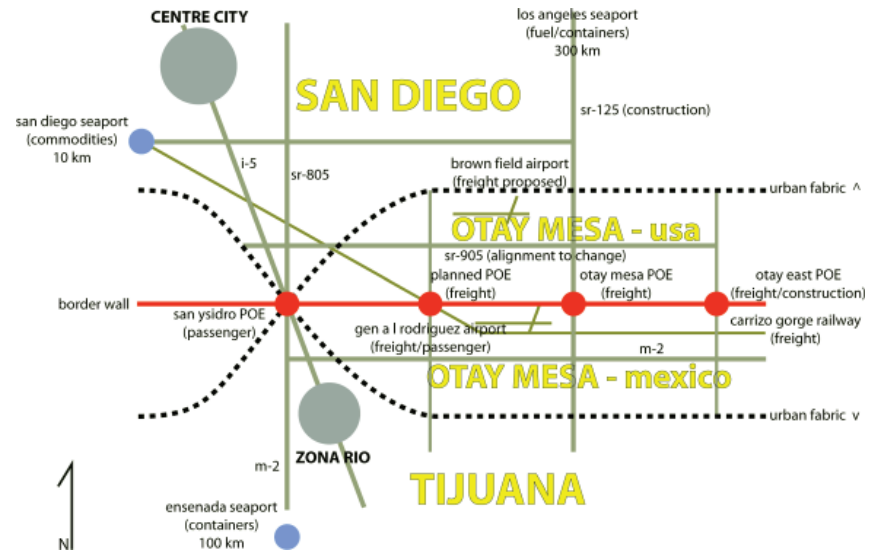
“Given such logistics innovations as supply-chain management in global production and delivery systems, regional competitiveness depends upon providing a seamless multimodal transportation network that efficiently links ports

and airports to highways and rail systems” (Erie, 2003, 8).

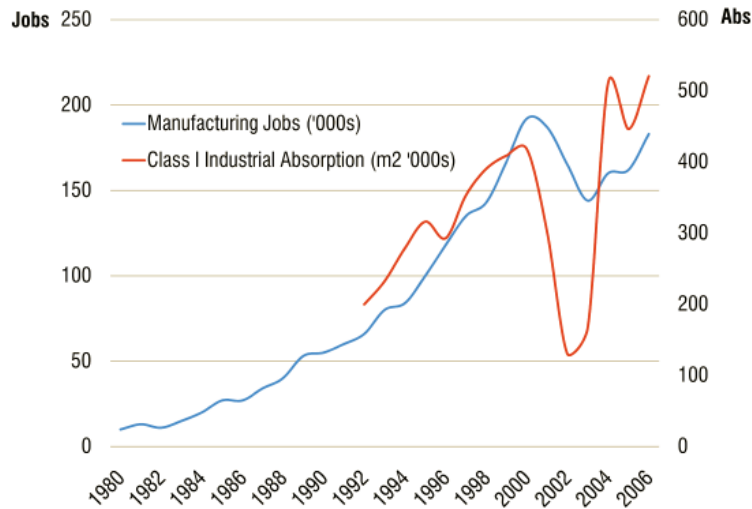
Erie and Nathan (2000) suggested that San Diego in general, and Otay Mesa in particular, require an additional US\$4 to \$5 billion a year in infrastructure, including a more sophisticated contract manufacturing base and world-class supply chain logistics management facilities, to remain competitive.

Otay Mesa’s role as a production node was first discussed at a con-

DIAGRAM OF BORDER/FREIGHT INFRASTRUCTURE

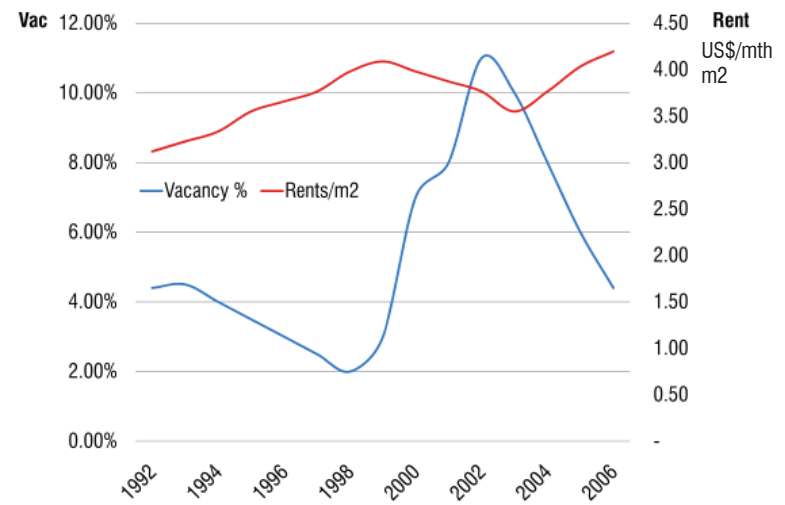


TIJUANA INDUSTRIAL EMPLOYMENT/REAL ESTATE ABSORPTION



extrapolated based on data from the Asociación de Maquiladora de Tijuana (AIM), the Consejo Nacional de la Industria Maquiladora de Exportacion (CNIME) and Maquila Properties, Inc

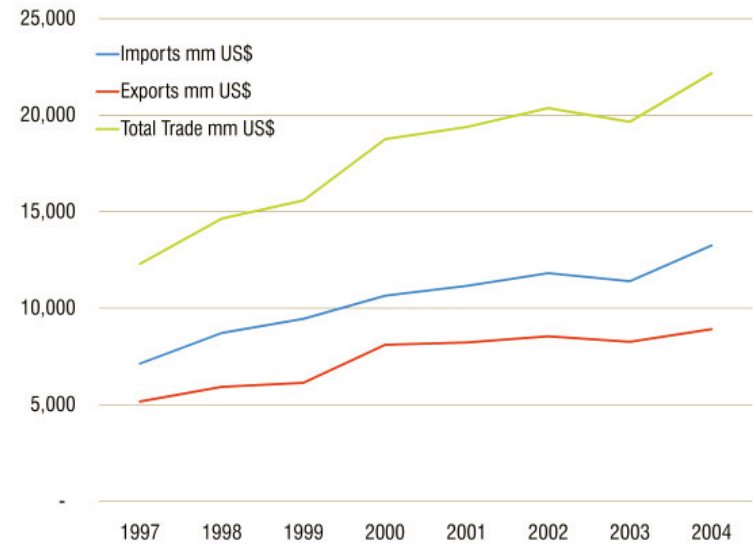
TIJUANA INDUSTRIAL REAL ESTATE VACANCY



ference of industrialists and planners held late in 1985, called by legislators to obtain consensus on disposition of the site, on the back of the opening of the second POE, annexation by San Diego of some 1,800 hectares, construction of a sewer line and the permitting of a 200 hectare Otay International City free trade zone at the POE (County of San Diego, 1985). Competitive proposals had begun to emerge for non-industrial uses, including demands from the security apparatus as well as lobbies for prisons, landfills, open space and even a grand prix race track.

There appeared at the time to be little real understanding among planners or the business community about what would eventually become the true source of the district's comparative advantage:-- its potential as a complementary production and logistics platform for the *maquiladoras* industry and exploitation of the site's proximity to Mexico and the POE⁸. The conference attendees seemed more concerned about their per-

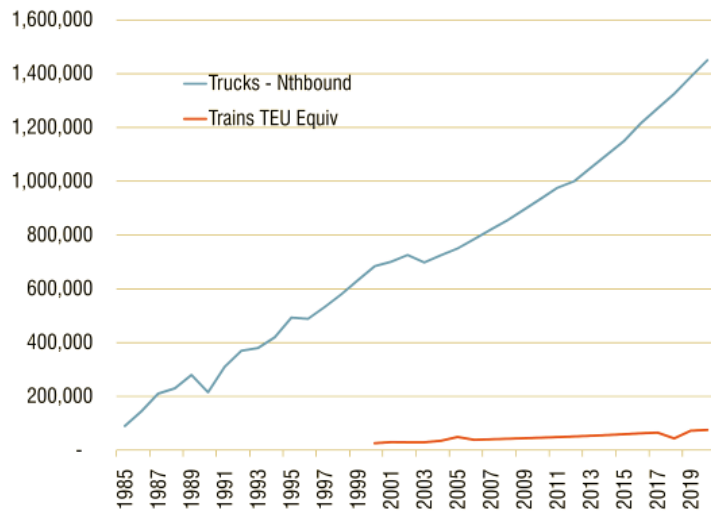
⁸ At the time there were only approximately 80,000 maquiladoras industrial workers in all of northern Mexico, versus over a million and a half today.



based on data from SANDAG, 2006

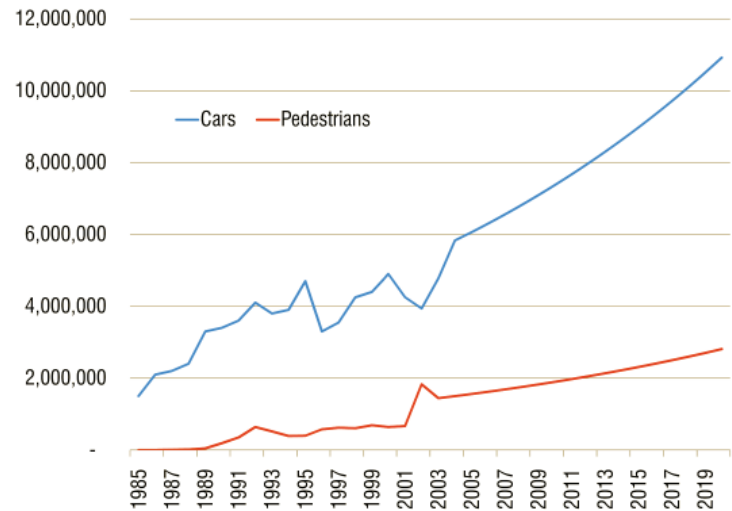
US\$ VALUE OF OTAY MESA INTERNATIONAL TRADE

ANNUAL NORTHBOUND FREIGHT by type/unit passing through Otay Mesa POE



based on data from SANDAG, 2006

OTAY MESA POE NON-FREIGHT TRAFFIC/YR



based on data from SANDAG, 2006

Containers and trucks, circulating on a 24/7 cycle, are a ubiquitous feature of Otay Mesa.

far right aerial imagery from United States Geological Survey, 2006



ception of a competitive threat from Tijuana’s incipient *maquiladoras* sector to San Diego job growth potential, and their perceived need for San Diego to free up large quantities of low-cost industrial real estate as an employer-retention incentive.

In the 1985 consensus, development would focus on low cost, large floorplate factory buildings, 5,000 to 10,000 square meters in size (County of San Diego, 1985). Other amenities would be kept at a minimum in order to control costs. One participant said,

“...distribution, administrative, quality control, some test equipment... you might very well see a restaurant. Truck servicing and a service station are likely. A motel is possible as well as freight forwarders and custom house brokerages. Only the infrastructure is missing now” (County of San Diego, 1985, 31).

Global versus National Empires

Even this minimalist development vision, which may, as previously noted, have been based on mistaken views about the district’s true value in global supply chains, was met with opposition from the traditional “hard” empire, which wished to preserve its prerogatives to treat Otay Mesa as a frontier border security outpost. Fi-

nancier Joseph Smith was quoted as saying,

“Small ideas start like the image problem alluded to. Here we are trying to sell Otay Mesa and in the meantime the Border Patrol.. is out showing a horror slide show. The statements they made were really unbelievable. They continued to show that slide show for probably three months before we got it pulled. It was misleading and absolutely absurd. There are a lot of things that people are fighting us on every inch of the way... we are not asking for a free ride. We are just asking for people to get off our back because we don’t need to carry a dead load” (County of San Diego, 1985, 38).

A similar conflict later developed between the City of San Diego and multi-national corporations, on the one hand, and the security apparatus, on the other, over the re-opening of freight rail into the area (Lindquist, 2004). Security officials from Washington DC feared that international terrorists or even future local insurgents would exploit the rail to carry weapons of mass destruction to major population centers in the US interior. In the end, the conflict was resolved in favor of the municipal authorities, and the rail link was opened.

This tension, between the security apparatus of Otay Mesa and the per-

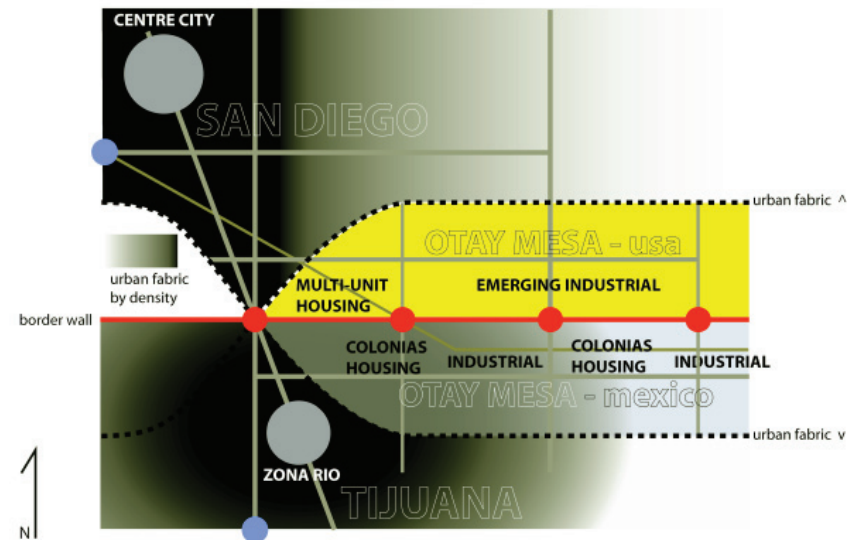


DIAGRAM OF URBAN CONTEXT

OTAY MESA SATELLITE IMAGE
United States Geological Survey, 2005



ception of the municipalities and the representatives of global corporations, has persisted over the last two decades. This contest will undoubtedly continue to inform Otay Mesa's development into the future.

Infrastructure Constraints

At present, lacking the trade infrastructure sought by multi-national corporations and municipal officials since 1985, the current Otay Mesa POE and a second proposed one to its west, connect mixed-use residential and industrial neighborhoods of Tijuana with mono-functional industrial/warehouse areas on the San Diego side with highly congested truck and passenger vehicle roads. Commuters and others require private cars to navigate these crossings, and private automobiles are unaffordable luxuries for many Tijuana and San Diegans⁹.

This lack of access options for workers to reach their jobs and a shortage of accessible affordable housing are increasing problems. Worker housing is effectively unaffordable in many neighborhoods on the US side. On the Mexican side, worker

⁹ Household car ownership in the neighboring San Diego district of San Ysidro is only approximately 60% (Cruz, 2002).

housing, most of which is located in the *colonias populares* (informal squatter settlements), is deteriorating as settlements sprawl further and further away from public transit systems, increasingly to dangerous hillside neighborhoods without access to basic services such as water and power. The average commutation times to plants on the Mexican side, from the outer settlements of Tijuana, can take up to one to two hours, for workers without cars. Average commutation times to the US can take up to two to four hours each way.¹⁰ Proposed new border restrictions and expansion of the BIS promise to further exacerbate these commutes.

Economically speaking, border wait times result in US\$4.2 billion in lost annual output, and the loss of over 42,000 jobs on the US side¹¹. These excessive wait times and the associated economic costs are a condition that the region's primary economic competitors in Asia do not have to face. The lack of proximal worker housing is yet another competitive constraint:-- while manufacturing wages in Tijuana are generally com-

¹⁰ SANDAG (2006). *Economic Impacts of Wait Times at the San Diego-Baja California Border, Final Report*. San Diego, CA: SANDAG.

¹¹ Ibid.

petitive with those of Asia (Gerber, Carillo, 2002), especially given San Diego/Tijuana's proximity to markets, *per capita* public investment in worker housing and public infrastructure are reported by local officials to lag those Asian alternatives.

Consequences of Globalization

In 2006, the Museum of Contemporary Art, San Diego, curated an exhibition on the border, called "Strange New World" (Museum of Contemporary Art San Diego, 2006). The catalog included the following commentary on the *status quo*: "The city itself is delineated by the border, a nineteenth century political construct, but its clash of social, economic, and cultural boundaries is a product of the twenty-first century" (118). The catalog went on to say:

"The social and economic reality of the Tijuana/San Diego border... can be described as the perfect outcome of the consumerist society that New Realist artworks sought to concretize; it is a place ruled and regulated by the assembly and distribution – and, importantly, the resulting waste – of products made for an increasingly homogenous global consumer. Since the 1960s, the border region at once has been shaped by and has adapted to industrial import-export assembly factories, or *maquiladoras*, that have created an imbalanced physi-

cal and social landscape simultaneously poised between the purported modernity of industry and its toxic side effect" (223).

Rem Koolhaas described the significance for San Diego/Tijuana urban form of the border area's role as a globalized production area in the following way, with particular respect to what he has alternately termed the "catastrophic urbanism" and "trans-frontier urbanization" of the city:

"The economic disparity between the US and Mexico is higher than that between any two neighboring countries in the world. One of the results -- a new kind of intra-urban arbitrage -- is abetting the formation of huge new industrial-urban settlements... producing some of the most startling new patterns of colonization and capital accumulation in America today... Physical development today can increasingly follow purely economic, statutory and trade itineraries to produce new territorial objects free of the usual historico-cultural unity, identity or grounding. As a result, border territory is now prime real estate, and settlement patterns are being profoundly altered as a result: infrastructure, investment and populations are migrating in droves, setting into motion what may be the dominant form of con-urbanization over the next decades: border states. These new organizations are nonetheless bound to share the same natural ecologies and

reservoirs of resources” (Koolhaas, 2001).

This final dimension to the globalization of San Diego/Tijuana is critical:-- ultimately, the viability of the city as a production node is constrained by ecological systems and their capacity. Koolhaas suggested that this constraint is pressing on San Diego/Tijuana as a border city.

:NODE IN CITY

Until recent decades, San Diego and Tijuana may be characterized as economically and socially-related dual cities connected by roads and, at various points a history, a border check point (Buursink, 2002). During this period, the *mesa* was settled by various cultural groups and was the site of conflicts between those groups (see historical diagram on the following pages). Over time, the two cities grew to fill the agrarian area between them, to the west of the mountains and to the east of the Tijuana River estuary (see historical maps, below). Finally, in the 1990s, with Otay Mesa only partially developed, the fluctuating interface line between the two municipalities was hardened into a physical borderline. Otay Mesa’s current situation

in respect of San Diego and Tijuana neighborhoods are shown in maps in the following pages.

This section describes the relationship between San Diego and Tijuana and the issues that concern their respective governments and planners, in the context of this history.

Semiotic Nature of the Border Zone

Border cities, of which San Diego/Tijuana is, for many, the quintessential example, have started to feature in the literature of urban planning and geography as a distinct phenomenon. Buursink (2002) defined these border cities in the following way:

- (i) cities dependent on the border for its existence, at least to some extent, possibly isolated from other national cities by distance or geography;
- (ii) cities located at points at which routes cross borders, where people and goods enter and leave;
- (iii) cities that differ in physical appearance, particular with respect to streets and building types; and
- (iv) cities that are peripheral, located far away from national cores and main cities.

The nature of the relationships between such paired cities may change over time:

“Integration of border cities is to be conceived off as the process of getting more and more involved in each other’s community business. It is not necessary to think of a complete integration (fusion) when only steps of material and organizational nature bring the two neighbor cities together. Physical infrastructure (new bridges and roads) will reconnect both settlements. Social interaction may follow when people of both sides have social contacts with people and amenities in the partner city” (Buursink, 2002, 19).

Ford (2005) and Herzog (1997), both local scholars, go further than Buursink with particular respect to San Diego/Tijuana. They appear to argue that the two cities are not just “paired” but rather are functionally, one city. That one city, they argue, is more correctly described as being divided in ways other than the border, such as Herzog’s seven ecologies (cited in the Introduction) and Ford’s geomorphological classifications by which he proposed to divide the city’s functions and sociological groups into the topographies they respectively inhabit (such as the coastal plain, the inland *mesa* and the valleys and mountains).

Herzog (2000) went on to argue that San Diego and Tijuana share “interactive circuits” (6):-- trade, labor migration and global manufacturing systems. Together, these systems share “a common landscape of interwoven settlement patterns, hydrological and biological spheres, and complex environmental stresses that accompany the massive economic and demographic transformation of the borderlands” (7). In this transformation cities blend into “single functional spaces or transfrontier metropolitan regions. These new transfrontier metropolises are beginning to build, or at least think about, crossborder infrastructure (new bridges, airports, mass transit lines, shared activity spaces, shared sewage treatment facilities), cementing the physical form of these cross-national urban structures” (7).

A different view is taken by Teddy Cruz and other scholars, who argued that the areas separated by the border are functionally different, but that they work together (or fail to work together) to produce the whole of the city. Rodriguez (1992) described what he perceived to be differences between the two cities:

“Tijuana and San Diego are not in the same historical time zone. Tijuana is

poised at the beginning of an industrial age, a Dickensian city with palm streets. San Diego is a postindustrial city of high impact plastic and despair diets. And palm trees. San Diego faces west, looks resolutely out to sea. Tijuana stares north, as toward the future. San Diego is the future -- secular, soulless. San Diego is the past, guarding its quality of life. Tijuana is the future... Taken together as one, Tijuana and San Diego form the most fascinating new city in the world, a city of world-class irony" (Rodriguez, 2002, 84, 106).

Michael Dear (2003), commenting

directly on the border interface itself, said that it comprises of a set of spaces characterized by "fear, violence, hatred and intense, energetic hope" for a more redeeming future. These spaces act, through a sociological processes, to produce what he termed "plural and particular cosmopolitans" (10); in other words, the workers and residents of San Diego/Tijuana, subjected to the hybridizing *Anglo/Latino/global* environment of their city, become non-elite cosmopolitans, with a correspondingly higher sophistication of discourse

and, he argued, artistic expression.

This hybrid, cosmopolitan culture may be seen in the city's vernacular arts, which range from architecture and indigenous systems of urbanism¹², to music (e.g., the Norteño and Nortec traditions) and visual arts¹³, to agricultural innovation, cuisine, and linguistic forms.

The Planning of Otay Mesa

Kada and Kiy (2004) conducted an assessment of planning conditions in the border interface zone and studied the mechanisms and processes by which residents in that zone, in either city, manage their communities. Instead of focusing on geographical

12 e.g.: Uliss and LeClerk (1999) characterized the area's design innovations as a "laboratorio de la postmodernidad"; and Lawrence Herzog (1999) described in detail the characteristics of San Diego/Tijuana's hybrid architecture.

13 e.g.: Michael Dear (2003) documented artistic innovation in the San Diego/Tijuana region; internationally regarded designers and artists such as Torolab and Estudio Teddy Cruz have emerged from the region; and several major exhibitions on local art, music and urbanism have recently been held in the two cities including the 2006 *Habitando la Frontera* exhibition in Tijuana and the 2006 *Extra Nuevo Mundo* ("Strange New World") exhibition in San Diego.

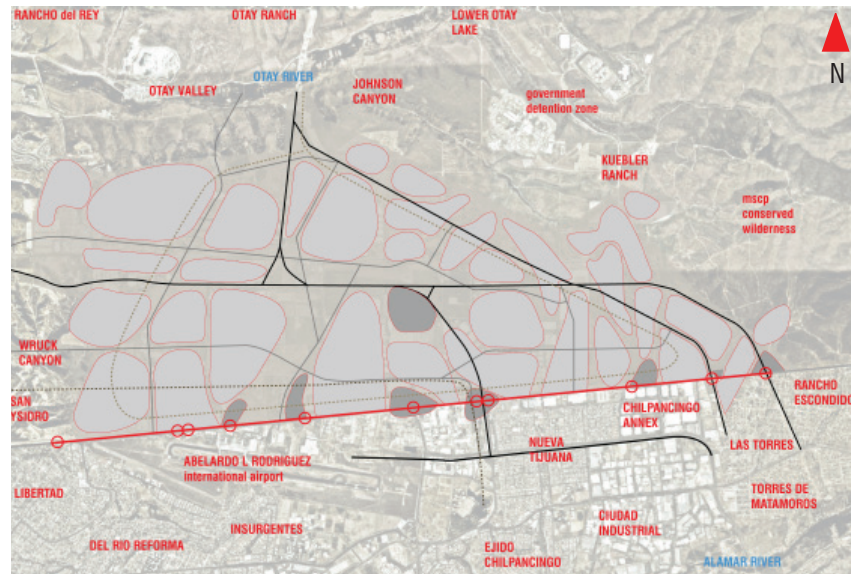
divisions, they classified the border zone as a set of constituencies or "community assets" in categories that cut across the border, such as businesses/manufacturers and their associations; regional educational institutions; churches/religious institutions; NGOs/community/ethnic organizations; elite cultural institutions; government; and homeowner associations (particularly important in Mexico); *et cetera*.

They argued that these groups combine and coordinate, or fail to combine and coordinate, in different ways, to address regional planning concerns that effect their constituencies. These concerns, they argue, consist of a set of issues that, for the most part, influence urban form and management on both sides of the border: (i) long border waits; (ii) rising housing costs, particularly shortfalls in affordable/worker housing; (iii) urban sprawl/ecosystem impacts of sprawl, particularly in respect of hydrology and habitat; (iv) siting of manufacturing/assembly facilities near underserved communities; (v) inadequate sewage and waste facilities and their inequitable concentration at or near the border interface; (vi) limitations in worker childcare; and, primarily in a Mexican context,

OTAY MESA NEIGHBORHOOD CONTEXT

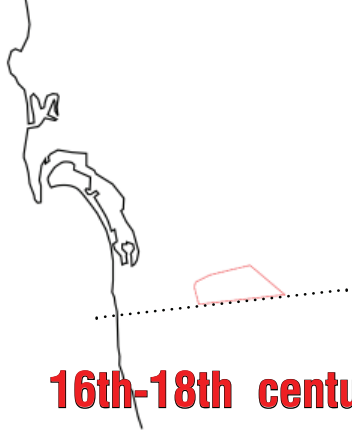
underlying satellite image from Google Earth, 2006

1 km



RANCHÉRIA

INDIGENOUS TRIBES
SPAIN 1542-1822



city **16th-18th century**

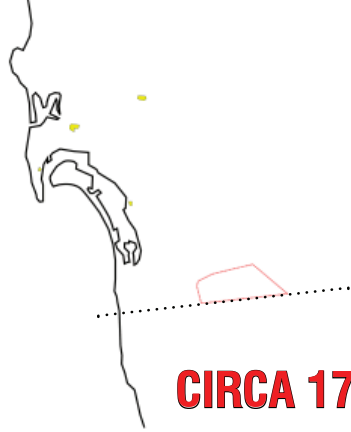
site
**KUMAYAAY TRIBES
CONQUISTADORES
GATHERING
EXPLORATION**



San Diego Historical Society

GENOCIDE

SAN DIEGO 1769
MEXICO 1822-1848



CIRCA 1780

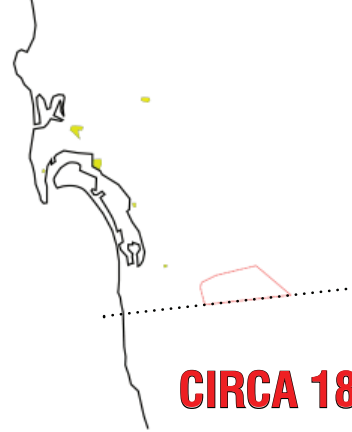
**MISIONES RULE
ROYAL RANCHES
CATTLE GRAZING
KUMAYAAYS FLEE**



San Diego Historical Society

RANCHO

US CONQUEST 1846
GOLD RUSH 1849



CIRCA 1850

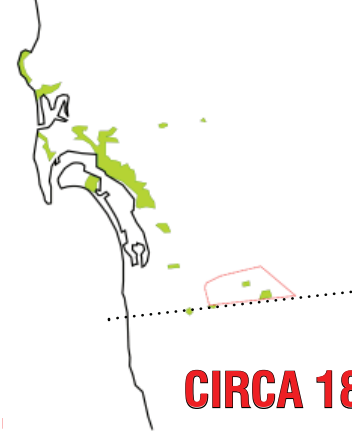
**ESTUDILLO RANCHO
FEUDAL RANCHES
CATTLE RANCHING
ANGLO LAND GRAB**



San Diego Historical Society

BOOM/BUST

TIJUANA 1886
NAVY BASE 1907



CIRCA 1890

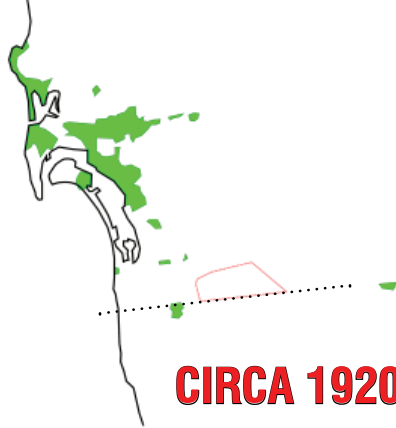
**SIEMPRE VIVA TOWN
DRY FARMS/TOWNS
GAMBLING/CITRUS
IWW GUERRILLA WAR**



San Diego Historical Society

FARMING

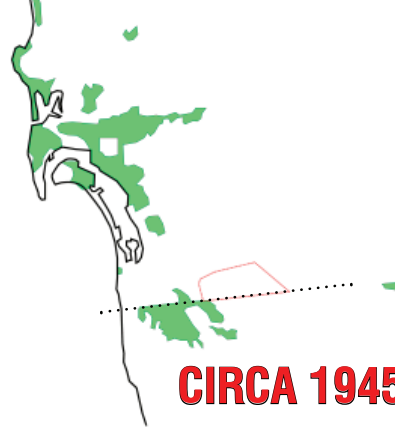
LINDBERGH 1927
EXPOS 1915, 1935



CIRCA 1920

WARWORKS

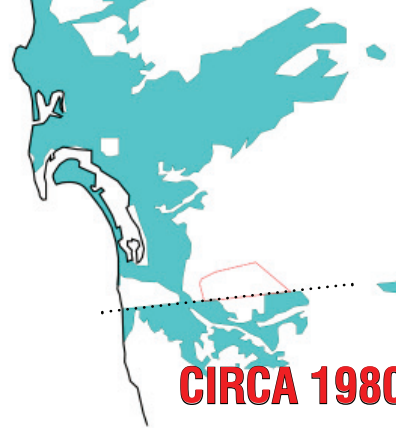
DEFENSE IND 1940
BIP MAQUILAS 1965



CIRCA 1945

SPRAWL

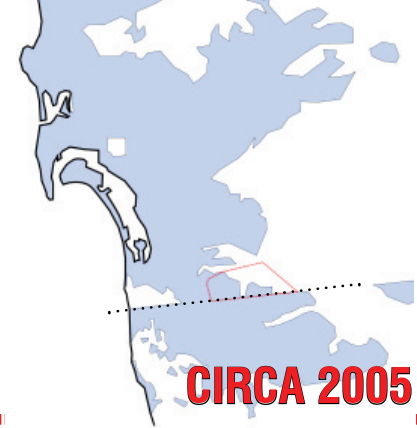
MASSIVE SPRAWL
SD-TJ RAIL 1980



CIRCA 1980

INDUSTRY

BORDER WALL 1993
NAFTA 1994



CIRCA 2005

city

site

**JAPANESE FARMS
AIRPORT/OTAY DAM
FARMING/MINING
LATINOS EXPELLED**

**NAVAL BASE
MUNITIONS PLANTS
MILITARY/FARMING
JAPANESE INTERNED**

**PORT OF ENTRY '85
WATER PIPES '61
YONKES/INDUSTRY
BORDER PATROL**

**POE EXPANSION
URBANIZATION
INDUSTRY/LOGISTICS
WALL/MINUTEMEN**



San Diego Historical Society



San Diego Historical Society



top Dept of Homeland Security



top SDIMC (by-nc-sa), Grubb & Ellis



Otay Mesa plateau is viewed from west; San Diego/Tijuana's joint sewage treatment facility is left foreground; Tijuana's Zona Norte neighborhood is right foreground; Libertad neighborhood is right background, San Diego's San Ysidro neighborhood is center left; double-border wall bisects the image.
underlying image from the US Department of Homeland Security, 2006 (Gerald L Nino)



Otay Mesa, emphasized in red, is shown in regional context along with the names of nearby districts, access/water infrastructure and natural features.

underlying satellite image from Google Earth, 2007



UPPER RIGHT: *yonkes* automobile graveyard; UPPER MIDDLE: condominium tract above canyon; UPPER RIGHT: logistics facility adjoining border wall; MIDDLE LEFT: factories viewed from canyon; MIDDLE RIGHT: upper-middle income housing tract across Otay River from site; LOWER LEFT: Brown Field airport; LOWER RIGHT: retail services near border crossing.

(vii) unplanned squatter settlements.

This dynamic process differs significantly from the top-down planning models favored by US and Mexican

city officials. The original plan for the highly successful Otay International Center, the 200 hectare mixed-use area immediately abutting the POE, was an exercise in central planning.

The plan called for precise specifications for a “master planned border community” and “foreign trade zone” down to the lot and building level, for industrial estates, commercial border

services, customs brokers, general industrial development, and, offsite, two prisons and an offsite 500 hectare off-highway vehicle park (County of San Diego, 1985).

New planning mechanisms may need to be considered that do not have such pre-conceptions about the limitations or the desirability of the site for a broad range of programs.

Such flexibility in planning is made all the more important by the fact that Otay Mesa is one of the last remaining undeveloped tracts of land in the metropolitan area. Aside from the downtown San Diego Centre City core itself, which is the subject of intensive redevelopment efforts, and the Valle de las Palmas district, south of Tijuana, the site of a residential new town, Otay Mesa may be the last area appropriate for large scale medium-to-high density mixed-use development. The other two districts to the north of San Diego, identified by SANDAG as being suitable for future development are, due to terrain, access and hydrological conditions, appropriate only for relatively low density residential development. Otay Mesa, despite its proximity to the BIS, is seen as an important component of San Diego's housing and commercial development strategy, as well as its plans for preservation and expansion of manufacturing and industrial capacity.

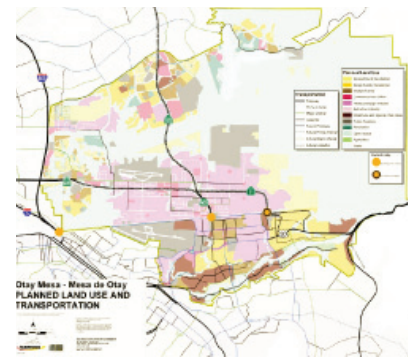
This realization has insured that the

area has been the subject of attention by planners. A number of alternative development and design strategies have emerged over the years, representing a range of the competing agendas of the site's constituencies.

Plans for the site date back to the 1974, when Kevin Lynch recommended that Otay Mesa be considered as the site of a new binational international airport along with industrial and commercial programs.

San Diego County's 1983 plan proposed that most of the site be transformed into a vast industrial estate.

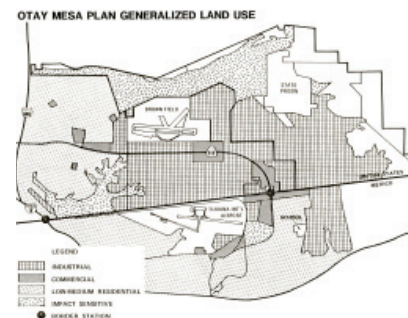
A visionary plan, the IC-SUSD proposal, prepared in 2003 by an international consortium consisting of municipal government personnel from both San Diego and Tijuana, academic and resource utility sector representation, and the planning firm Planning Design Consultants suggested almost the exact opposite:-- that the site should be transformed into a new central business district for the entire metropolitan region, due to its equidistant proximity to respective population centers in San Diego and Tijuana. That plan effectively assumed the disappearance of not only the existing security appa-



binational strategic plan to continue current industry-oriented trends SANDAG, 2006



Otay Mesa as the new central business district for the metro area IC-SUSD, 2003



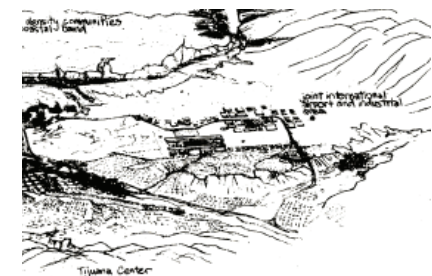
vast industrial estate, hsg at edges County of San Diego, 1983



freight and mass transit master plan focusing on POE/industry SANDAG, 2007



Otay Mesa framed by nature preserves and conservation areas County of San Diego, 1998, MSCP



regional airport and industrial estate Lynch, Appleyard, 1974

tus and removal of the BIS, but also the very concept of a border.

The Multispecies Conservation Program (“MSCP”) enacted in 1998 authorized condemnation and acquisition by the public sector of most of the sensitive canyon and foothill land to the north, east and west of the site for permanent conservation.

Finally, plans under development as of this writing revert to the industrial concept, but with a slightly greater mixing of housing, commercial and regional freight infrastructure systems, and with greater deference to the importance of the POEs for cross-border commerce and trade.

These plans either accept without challenge the *status quo* on the site or, in the case of the IC-SUSD plan, would require a revolution to occur.

One dissenting voice to the 2005 to 2007 planning process came from the real estate development community. The London Group, a local real property research firm sometimes used as a mouthpiece on public policy issues by the development industry, released a research report in 2006, in which it called for greater flexibility from city planners in inte-

grating housing into predominately industrial areas. The report was apparently timed to coincide with the drafting of the 2006 SANDAG draft plan document, and it focused on Otay Mesa.

The London Group (2006) recommended that the city create an “industrial collocation easement” which would allow for residential housing to be built in proximity to or in mixed-use structures with light or non-polluting industry. They also recommended land-use segregation decisions be made on a case-by-case, rather than a zone-by-zone basis; they proposed that San Diego should accurately value the burden on transportation infrastructure caused by commuters in segregated land-use scenarios; and they suggested that San Diego should consider offering incentives for workers who choose housing in walking distance of their work sites.

If enacted, these changes would permit mixed-use development of Otay Mesa. They may also reduce the strain of development on environmental systems.

:NODE IN NATURE

The principal environmental constraints on Otay Mesa’s development and on population and industrial growth are physiography, hydrology and vegetation (Painter, 1985). Air quality presents an additional constraint (Kazimi et al, 2006).

Basic Orientation

As has been noted previously, Otay Mesa is a claystone/sandstone plateau located between two major watersheds, the deep Otay River Valley, directly north of the site, and the much more substantial Tijuana-Alamar complex, located roughly four kilometers south of the border. To the east, the topography quickly becomes inhospitable, with 45+ degree grades fairly common in the craggy foothills of the San Ysidro Mountains. To the west, the tableland ends in a sharp fall-off into a riparian canyon system. Canyon streams, in turn, drain into the Mexican Zona Rio district and, onward, to the Tijuana River which returns, across the border and enters the San Diego neighborhood of San Ysidro. From there, the river drains into an extensive system of wetlands, known as the Tijuana River Estuary, located between the urbanized area and the

sea. The Alamar River, which lies in a valley south of the tableland, eventually drains into the culverted (channelized) Tijuana River, which, in turn, drains back into the US directly west of San Ysidro. The Otay River drains an area northeast of the site, including a dammed lake, Otay Lake, which serves as a regional reservoir. In turn, the Otay River drains into San Diego Bay. A number of streams drain southward from the *mesa* into Mexico and the Alamar, and Johnson Canyon, a craggy depression to the northeast of the site, contains a stream that drains northwestward into the Otay River.

The *mesa* tableland itself slopes gently upward moving from west to east. Human interventions have created hillocks and berms that are, perhaps, the most significant topographic features. In addition, there are clusters of small cistern-like formations called *mima* mounds of unknown origin. These contain perennial or seasonal vernal pool formations inhabited by the San Diego fairy shrimp (*branchinecta sandiegonensis*), an endangered brachiopod, and other unique species (Bauder, McMillan, 1998).

The canyon areas north, east and

west of the site are subject to varying degrees of conservation protection, ranging from outright public ownership to development permit restrictions. Under the MSCP, those limited areas within this envelope not presently under public ownership are slated for condemnation. In any event, the physiography of these areas makes them inappropriate for development.

Physiography

The mountains to the east of the site consist of depositional materials from the Peninsular Ranges, while the *mesa* itself consists of alluvium resulting from the erosion of the same mountains (Painter, 1985). The *mesa* has a fluted topography at its edges, dissected by streams. These streambeds are comprised of an even bed of sandstone, shale and conglomerate, while the terraces themselves are remnants of a Pleistocene delta, consisting of sandstone and claystone (Painter, 1985; Baker, 1971). The one physiographic anomaly on the terraces are the *mima* mounds, which are approximately one meter in height and extend 3 to 6 meters in diameter. These are possibly moraines, evidence of fossil activity or even, conceivably, man-made to collect rainwater (Bauder,

McMillan, 1998).

Soils on the *mesa* consist of gravelly clay loams in the west and clay soils from shale and sandstone in the east. The middle of the site, in the area of the vernal pool complexes, contains rich USDA prime capacity-rated growing soils of the Salinas series (Painter, 1985).

Areas of contaminated soils exist, particularly in the western and north-western portion of the site. *Yonkes* automobile graveyards, some operating since the early 20th century, have been responsible for chromium, zinc, copper, cadmium, nickel and lead contamination (Corliss, 2000). Brown Field is likely contaminated with jet fuel and possibly improperly stored industrial chemicals. Heavy metals and industrial solvents may also be issues on some industrial sites (Kopinak, Barajas, 2002).

Hydrology

Water is considered by many to be the single most problematic issue in Otay Mesa, and the primary constraint on the *mesa's* future development. Water is an issue both because of its scarcity for drinking and industrial purposes and because risks to the hydrological system threaten human

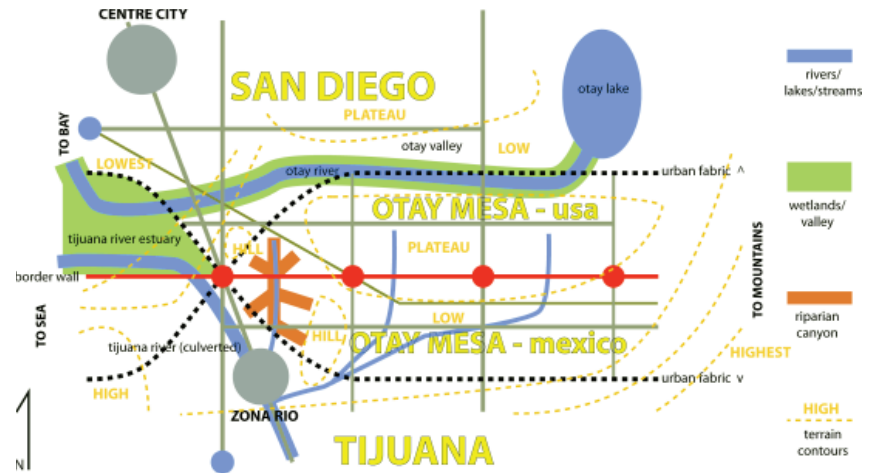


DIAGRAM OF TERRAIN & NATURAL SYSTEMS



MAP OF MSCP CONSERVATION AREAS
City of San Diego, 1998, Final MSCP Plan

health and safety (Michel, 2000).

There are no identifiable groundwater formations under the main portion of the *mesa* with brackish groundwater deposits existing near the edges (Painter, 1985). Surface water is present in the vernal pools, in canyons, in streams, and in other natural drainage areas, with the amount varying substantially by time of year.

Both of the two rivers to which the site drains are dammed, heavily polluted with industrial contaminants and with poor water quality due to eutrophication of surface runoff (Michel, Graizbord, 2002). The diversion of streams, by the BIS and urbanization, feeding into the Alamar River, threatens extensive groundwater formations present in that river valley by reducing their recharge rate (ibid). These formations provide drinking water to thousands of Tijuana households (ibid). Severely contaminated water has become such a frequent occurrence that it has been given a common name: *aguas negras*: -- a dark, murky liquid consisting of water, untreated fecal matter and industrial waste.

Severe erosion and flood risks exist at the edges of the *mesa* and in can-

yon areas. Degradation of the hydrological system may heighten risks of erosion and flooding (Revah, 2000). Wastewater treatment is a key concern for Otay Mesa (Michel, 2000). At present, wastewater from the *mesa* is directed into a 17 kilometer sewage pipe (County of San Diego, 1985) directly north of the BIS and parallel to it, and carried downhill, due east, to San Diego/Tijuana's joint wastewater treatment plant east of San Ysidro. This facility provides primary-only treatment. The wastewater, after removal of only 84% of solids and with dioxins, mercury, surfacants, nitrates, phosphates and other toxins still in solution, is then dumped into the ocean through an outfall pipe near the San Diego county residential neighborhood of Imperial Beach (Michel, 2000). There are no plans to construct a secondary treatment facility at the present time. Forecasted development on Otay Mesa will, increasingly, challenge the viability of this method of wastewater disposal.

This picture is further complicated by nonpoint source pollution, primarily from metal discharges, commercial and industrial discharges into storm drains, runoff from impervious surface and vehicle particulate

emissions. Without any treatment to address them, such discharges are simply returned to the hydrological system.

Climate

Otay Mesa is an ocean-moderated semi-arid mesothermal steppe (Painter, 1985). Generally speaking, evenings year-round bring a nightly influx of fog and moisture in from the ocean. Days tend to be cool and overcast, due to the cyclonic eddy which circulates in the Gulf of Santa Catalina:-- the body of water, bounded by the coastline and the California Channel Islands¹⁴ (Bakker, 1971).

Rainfall tends to occur in the winter months and averages around 250 millimeters per year, including prolonged droughts during which the average may fall as low as 100 to 150 millimeters per year. *Chubascos*, heavy but brief intervals of summer rainfall, are the exception (Bakker, 1971).

Droughts occur on Otay Mesa when evapotranspiration exceeds precipitation and, as a result, precipitation does not reach the vegetation root

¹⁴ The channel and gulf are referred to here as "sea" or "ocean" and are, in local usage, considered to be the Pacific.

zone, preventing groundwater recharge and making the soil moisture deficient (Painter, 1985).

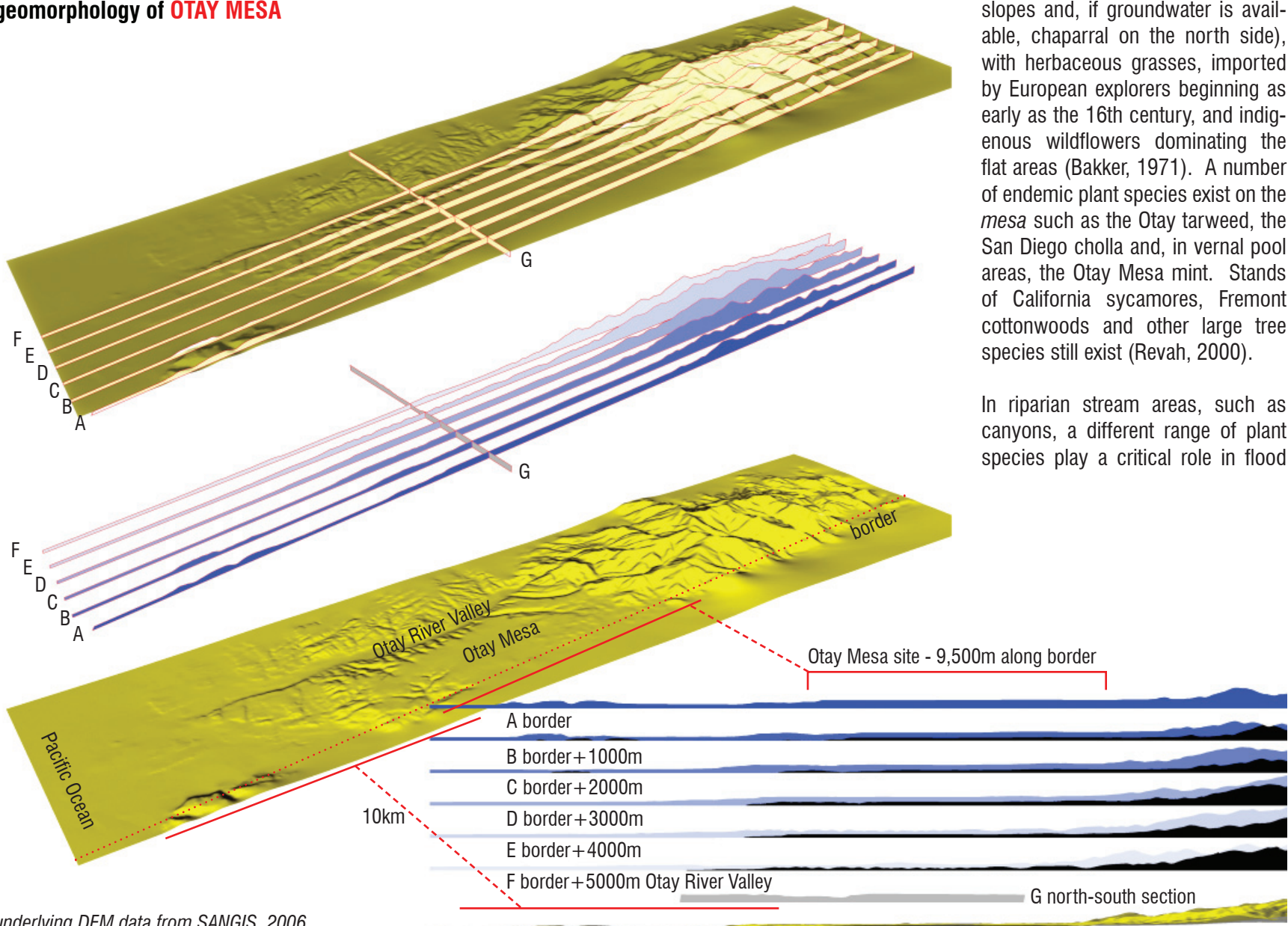
Average daily "high" temperature ranges from 14 degrees centigrade in December and January to 23 to 24 degrees centigrade in August. Temperatures can spike outside of this range during anomalous hot periods and during Fall Santa Ana conditions, when the prevailing winds shift from their normal eastward/northeastward direction to a westward one¹⁵. Fire risks are highest during the Santa Ana period.

Vegetation/Wildlife

Indigenous vegetation tends to be xeric and fire-germinated, with shallow root systems incapable of reaching groundwater aquifers (Bakker, 1971), if those exist at all. Kumayaay tribes are believed to have used fire to manage and manipulate the architecture of shrubs and to increase the reproduction rate of grasses used for forage (Revah, 2000). Plant communities provide an year-round canopy, with very slow metabolism during the summer. Coastal sage-chaparral plant communities populate the slopes (sage on south side

¹⁵ National Oceanic & Atmospheric Administration.

geomorphology of OTAY MESA



slopes and, if groundwater is available, chaparral on the north side), with herbaceous grasses, imported by European explorers beginning as early as the 16th century, and indigenous wildflowers dominating the flat areas (Bakker, 1971). A number of endemic plant species exist on the *mesa* such as the Otay tarweed, the San Diego cholla and, in vernal pool areas, the Otay Mesa mint. Stands of California sycamores, Fremont cottonwoods and other large tree species still exist (Revah, 2000).

In riparian stream areas, such as canyons, a different range of plant species play a critical role in flood

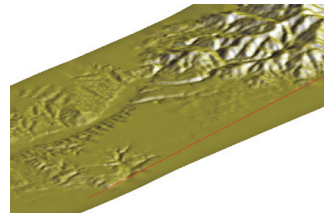
underlying DEM data from SANGIS, 2006



LEFT TOP: urban edge northeast of site; LEFT CENTER: near site's geographic center, looking north; LEFT LOWER: river bluffs north of site, looking south; BOTTOM: north end of site looking south; RIGHT UPPER: northeast corner of site; RIGHT CENTER: hills east of site; RIGHT LOWER: Otay Mesa from north, across Otay River Valley

physical systems of OTAY MESA

arid marine plateau (*mesa*) consisting of Pleistocene sandstone with a shale & conglomerate-base, 120-200m above sea level, habitats consist of grassland & deciduous coastal sage scrub; views extend to the sea & over Tijuana



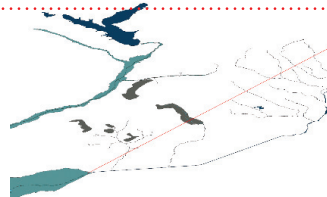
TERRAIN



WALL/DITCH

the wall comprises a pair of 5m steel-plate fences with the northern series topped by barbed wire & floodlight towers up to 10m; the space (ditch) between the tiers has developed into an unplanned muddy sump occupying 90,000m² across the site's 10 km border

seasonal north-south streams drain into the Alamar, which proceeds to the ocean via the Tijuana, and the Otay, which drains into the Bay; the *mesa* lacks accessible aquifers, but *mima* hillocks of unknown origin form perennial or seasonal cistern vernal pools, with unique ecosystems



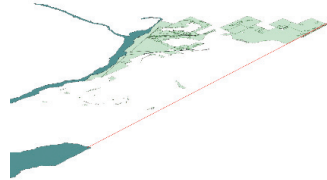
SURFICIAL HYDROLOGY



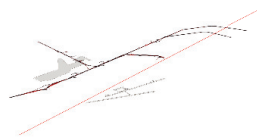
BUILDINGS

2,500-40,000m², 8-12m high, 30-60% lot cover, big-box tilt-up/steel-frame factories and warehouses, total approximately 1.5 million m² industrial space surrounded by impervious surface (truck/container yards); 43% of the site is developed

development patterns & the wall "no-man's land" tend to ignore/block north-south seasonal streams, preventing recharge of the two river valleys' groundwater systems & creating flooding/erosion risks at the *mesa* edges (sometimes with deadly effect)



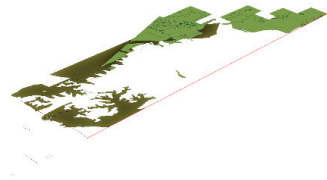
FLOOD RISK AREAS



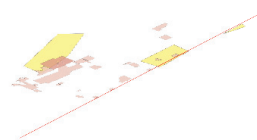
INFRASTRUCTURE

three separated-grade highways are under construction: north-south sr125 & east-west sr905 to the POE; sr11 will connect sr905 to a proposed east POE; Brown Field is an underused civil aviation airport; there is at present no site access to the regional airport bordering it

surrounded by riparian canyons forming fluted topography (*arroyos*) 40-140m above sea level at base, with extremely rich *flora* and *fauna*; although projected under the MSCP, canyons and their groundwater systems are under threat from runoff eutrophication

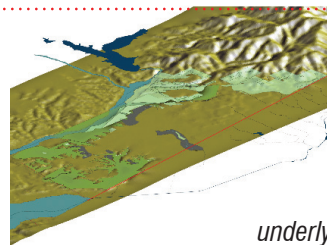


PROTECTED HABITATS

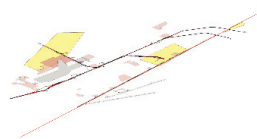


POLLUTION & TRACES

large tracts of mesa soil are contaminated, including 8 Superfund sites; causes include the century-old *yonkes* scrapyards, Brown Field jet fuel/solvents, uncapped landfills/illegal industrial waste, point-source run-off; there are several sites of possible archaeological interest



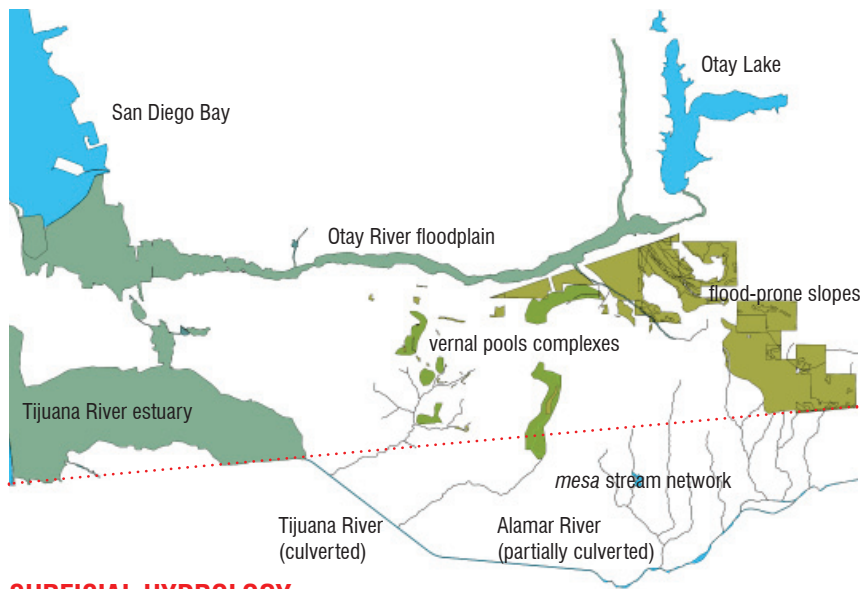
combined layers



NATURAL SYSTEMS

underlying GIS data for all images from SANGIS, 2006

BUILT SYSTEMS

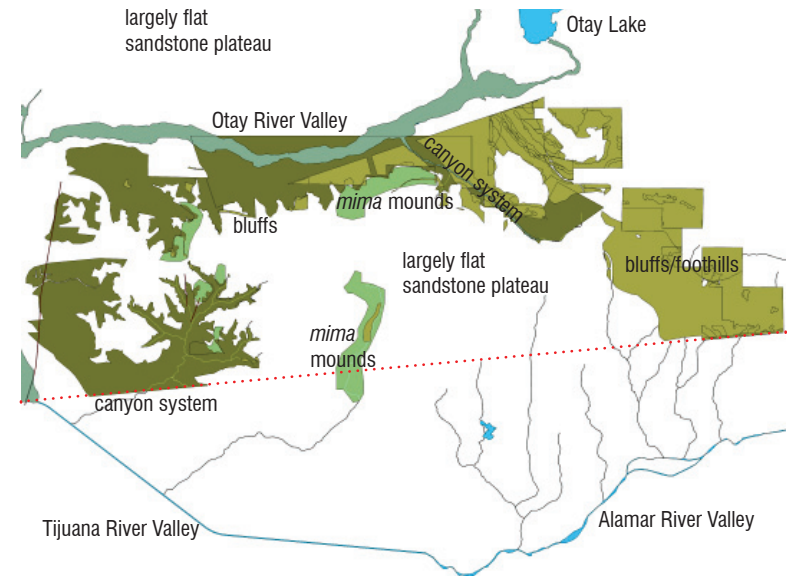


SURFICIAL HYDROLOGY

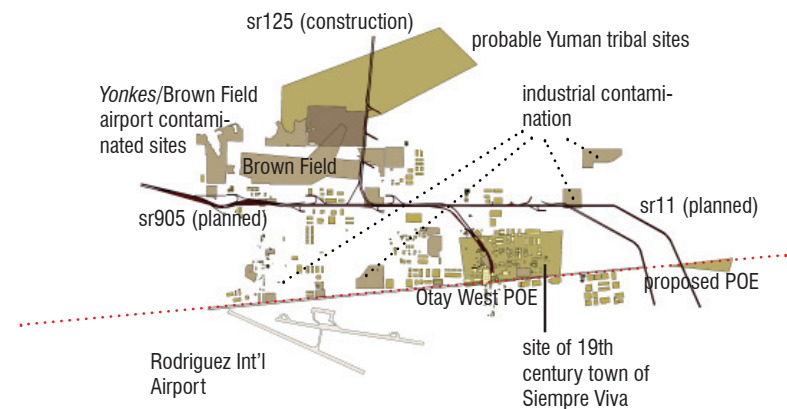
control, ground water recharge facilitation and water purification. Species include watercress, nettle, duck weed, yerba mansa, sedges, celery, rushes and cattails, as well as some of the larger shrubs found in sage-chaparral communities (Michel, Graizbord, 2002). Riparian vegetation plays a useful role by slowing the horizontal flow of water, trapping sediments, digesting nutrient contaminants, breaking down toxins, and providing shade to reduce evaporation. Riparian plant communities, comprises roughly 2.4% of the land cover (Revah, 2000).

Endemic animal species include the San Diego fairy shrimp already mentioned, and two bird species: the California gnatcatcher and the light-footed clapper rail, both of which are endangered, and believed to be threatened by the BIS.¹⁶ Most large San Diego animal species may be found in Otay Mesa, including the bobcat, the gray fox, the red fox, coyotes, mule deer, and several species of owl and birds of prey. Mountain lions may be found in the hills to the east of the site but only rarely venture onto the *mesa* itself.

¹⁶ San Diego County Sierra Club.



GEOGRAPHIC FEATURES/SIGNIFICANT HABITATS



BUILT PHYSICAL FEATURES & SPECIAL SITES

underlying data for images from SANGIS, 2006 and Painter, 1985

Revah (2000) recommended that conservation areas in areas like Otay Mesa should be scaled by disturbance regime, especially by fire-based habitat areas and by the species sustained in those areas. She proposed that corridors be maintained between patches of riparian vegetation and vernal pool areas, wherever possible and with the inclusion of buffer zones. Stepping zones are required between larger patches.

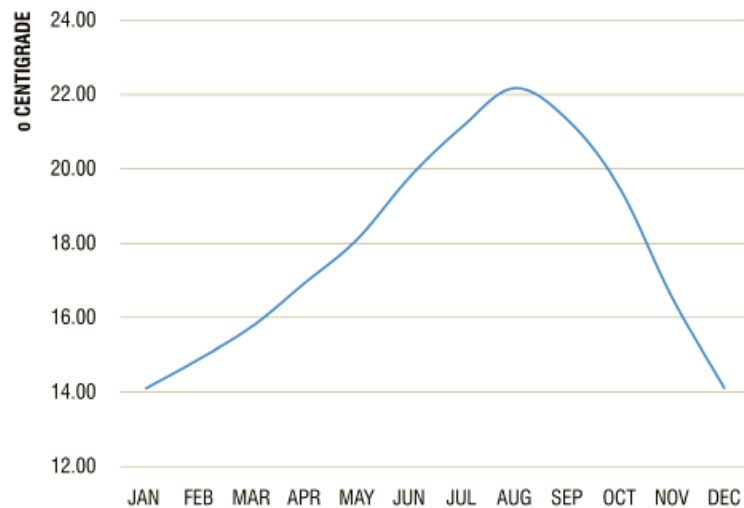
Revah (2000) proposed a proactive fragmentation strategy in order to reduce the ecological impacts of

land-use change. In particular, she suggested the preemptive establishment of buffer zones of various widths along water courses, with the aim of ensuring habitat connectivity, maintaining hydrologic stability and improving water quality. Deforestation and erosion in these areas would be actively managed.

:CONTENDED NODE

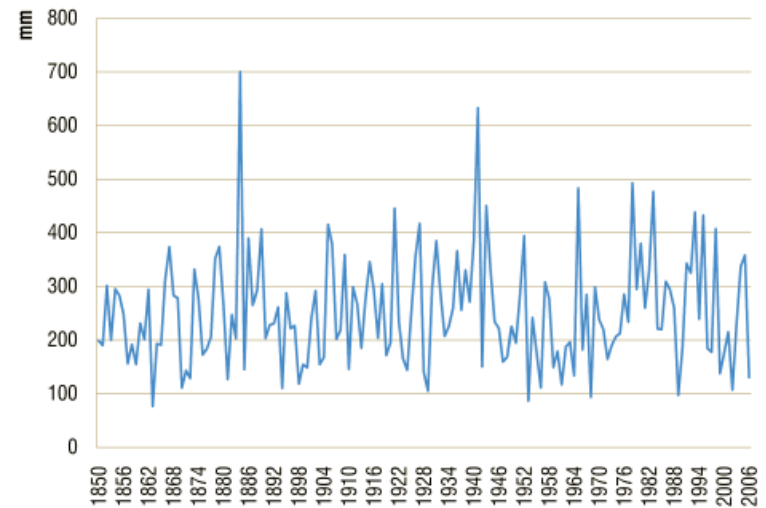
Geographer Michael Dear (2003) observed a number of characteristic themes concerning urbanization in San Diego/Tijuana: (i) that the city

AVERAGE DAILY HIGH TEMPERATURES

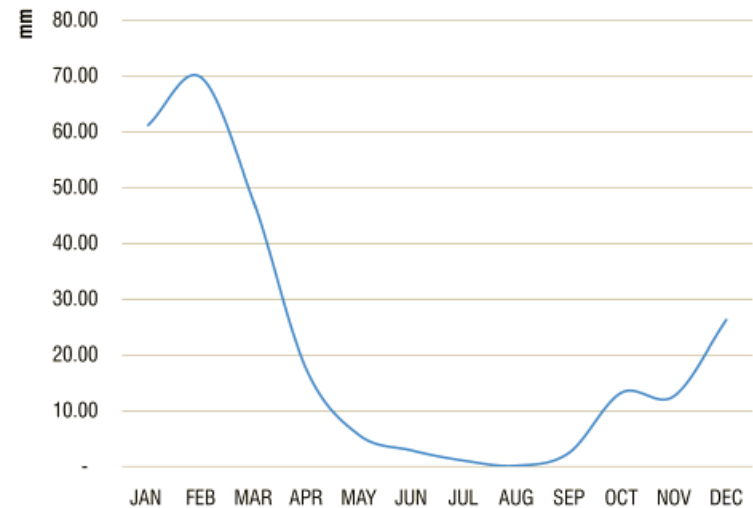


data from National Oceanic & Atmospheric Administration, 2007

AVERAGE HISTORICAL ANNUAL RAINFALL



AVERAGE MONTHLY RAINFALL



may be described as an unusually “fragmentary” patchwork of neighborhoods and sectors with respect to cultures, ethnicities, and so forth; (ii) that the city is characterized by “cracks and fissures” in power relationships of a sort normally seen in cities in conflict zones; (iii) that there is a convergence between areas of uneven or lagging development and non-*Anglo* cultural groups; and (iv) that there is a developed pattern of grassroots resistance to established systems of authority and the economic and political structures they impose, through protest and artistic expression.

This finding of conflict and contention in San Diego/Tijuana is consistent with the work of other scholars of border cities in general. Buursink (2002) concluded that conflict in contacts between the residents of paired cities are commonplace due to nationalism and cultural differences. Fanon (1968) noted another characteristic of peripheral frontier cities:-- spatial segregation or fragmentation, which he termed “compartmentalized place” and “divided cities.”

Division and contention have been themes in San Diego/Tijuana since

early in San Diego’s history. Historically speaking, the Mexican city of San Diego fell to besieging American forces in 1846, following a series of battles, and was formally annexed as part of the territory of California in 1848, pursuant to the terms of the treaty of Guadalupe Hidalgo, dictated by the US to Mexico. That treaty set the border according to a 1782 map. Due to a subsequent error in the placement of bollards denoting the actual location of the border, the Tia Juana ranch, which would one day become the site of the city of Tijuana, was located in Mexico instead of its correct location in the US (Montezemolo et al, 2006). Had the border been correctly located, geographical constraints would have made it unlikely that a major city would have arisen on the Mexican side of the border. This series of historical events set the stage for future conflicts over space and identity as well as anticipated what would eventually evolve into a dual city system.

Otay Mesa is at the center of this system, and it is seen by both countries as a place of strife:-- a site for crime and violence; an invasion zone for undocumented immigrants; a space of ethnic conflict between *Anglos* and *Latinos*; a place of identity politics so

intense as to be described by some national security authorities as a long term risk to US territorial integrity¹⁷; and a dumping ground for unwanted urban programs, such as prisons, waste-management facilities and squatter settlements. Cultural leaders have variously described the San Diego/Tijuana interface as a “border apartheid metropolis” (architect, writer Uliss Diaz), America’s “very own future Kosovo or Bosnia” (social critic and urban theorist Mike Davis), or simply “catastrophic” (architect, scholar Rem Koolhaas). Persisting ethnic and socioeconomic inequality is seen to be an entrenched problem¹⁸.

Judging from the statements of some politicians and national media outlets, the BIS is, alternately, a national asset, an important front in the War on Terror and the War on Drugs, and the salvation of the US economy and culture from the ravages of uncontrolled immigration. In

17 e.g.: Allen DeSocio (2002) suggested that the region has a distinct ethnic, cultural and political identity of a nature that may eventually come to favor calls for separatism.

18 e.g.: Paul Ganster (2006) called the region one of the most “asymmetric in the world” with respect to income and political and social power.



Conflicts over cultural identity, the meaning of the border, immigration. top Daryl Cagle MSNBC, grassfire.org anti-immigration group



Large conserved tracts contend with development pressures.

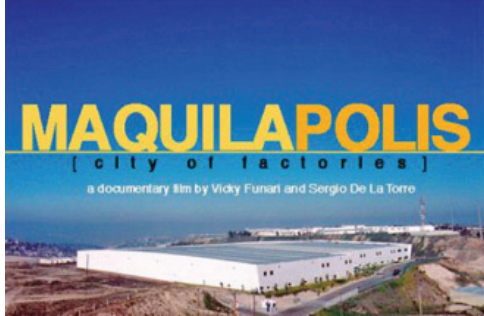
South of the site, virtually overnight urbanization in the absence of infrastructure strains ecologies.



bottom photo Nathan Gibbs (by-nc-sa)



iMigrate
 MAY 1, 2006: general strike, huelga general. boycott. walkout. buy nothing. sell nothing. no comprar nada. no vender nada. nationwide.
deletetheborder.org | indymedia.org | nohr4437.org



Current controversies over immigration, race, civil rights meet the politics of identity to create social volatility.
 right upper: John Parres (by-nc-sa), right center, center lower, right lower: Aymara/San Diego Independent Media Center (by-nc-sa), right lower: Vicky Funari, Sergio de la Torre "Maquilapolis" documentary film advertisement, targeting industrial worker exploitation; center upper: David Sasaki (by-sa), upper right: poster by Schock (by-sa) for Mayday general strike

Mexico and in many places in San Diego/Tijuana the BIS is a symbol of oppression, inspiring feelings of fear, outrage and despair. According to official estimates for the San Diego sector, approximately five hundred people have perished attempting to cross the BIS in the ten-year period from 1995 to 2005¹⁹, and the annual figure has generally surged upward after each successive strengthening of the barrier²⁰. Annual arrests at the BIS have ranged from the current level of around two thousand per week, down from a peak of ten thousand in the years immediately following the wall's construction.

In addition to the barrier itself, conditions in the neighborhoods surrounding it changed significantly since 2001, exacerbating and creating tensions and imposing something of a siege mentality²¹. A detailed over-

19 *e.g.*, Government Accountability Office (2006), GAO-06-770, *Report to the Senate*; human rights groups generally claim higher fatality counts.

20 *e.g.*, Leslie Berestein (2006), "Border Deaths on Record Pace," *San Diego Union-Tribune*, July 22.

21 For example, this author witnessed armed personnel stopping civilians, including minor children, in the streets or pulling them forcibly off mass transit vehicles and subjecting them to random

view of the situation as of this writing may be found at Stephen Dobyns article 2006 article published in the *San Diego Reader*.²²

Subsequent to Operation Gatekeeper and especially following the 9/11 terrorist attack, the wall was substantially and progressively reinforced with exclusion zones and parallel fences. According to US Congressional investigators, the expansion, now underway, may result in environmental damage to wetlands, habitats and the area's hydrological system and, faced with local opposition, is now apparently being developed by the Department of Homeland Security under the emergency suspension of all applicable laws (Nuñez-Neto, Viña, 2005).

Beyond the BIS, Otay Mesa has been a site of contention relating to use and control of space: *Anglo* versus *Latino*, central versus local; conservation versus development; industry versus security; and open borders versus enforced autarchy.

identification checks.

22 Stephen Dobyns (2006), *San Diego Reader*, December, "Border Angels" <http://www.sdreader.com/php/cover.php?mode=article&showpg=1&id=20061207>.

National constituencies have demanded ever-harsher methods to exclude unwanted persons from the US. Private militia "Minutemen" groups arrived from throughout the US in 2005 to act as a *vigilante* border security force-- a movement that has, as of early 2007, largely disappeared from Otay Mesa, for lack of local support. But the issue of border security retains resonance nationally. Constituencies throughout the country believe that Otay Mesa is a necessary first line of defense in the War on Terror and the frontline in controversies over relationships between the US and Mexico, *Anglos* and *Latinos*, and illegal immigration, or perhaps all immigration.

On the other hand, there is a history of local protest concerning the site and its environs, particularly with respect to deaths of undocumented immigrants, workers' rights and cultural identity. In general, the protesters have argued for a more humane approach to border security, an end to border militarization and the BIS, and in some cases, the end of the border as a barrier, altogether. Many of them also call for better working and safety conditions, and greater job security in the region's factories. A third protest theme relates to cul-

tural identity and cultural harmony. A fourth theme involves environmental groups which demand changes to BIS construction plans which, they allege, may cause harm to regional hydrological systems and habitats.

Contention between different constituencies reflect differing visions for Otay Mesa's future. Presumably all of these visions must re-contextualized and, as appropriate, restructured, synthesized and reprogrammed in order to produce an Otay Mesa in which all of these varied constituencies will be able to find something with which they can live comfortably or least peacefully.

:IN CRISIS

Otay Mesa plays a multiple role: as a node in "empire," a node in the city and a node in nature. The governments of the nations for which it provides a border, the corporations behind the globalized supply chains of which it is a part, the city to which it belongs, and the advocates for the natural systems that sustain it, all comprise agents that negotiate with one another to make decisions about the district's future. And in and of themselves, the standalone objectives of each agent yield results that

are unacceptable to the others. The result of this tension has been, and, if the *status quo* does not change, will continue to be indecision with respect to land-use, development, planning and design issues of the sort that has troubled the district since the mid 1980s.

But this *status quo*, as a zone of contention and, to return to Teddy Cruz's metaphor, of San Diego's retreat from Tijuana, is not a tenable one

for city leaders. As already stated, Otay Mesa is one of the last major underdeveloped areas in the city capable of supporting, on a sustainable basis, moderate densities. It also sits at a culturally, economically, and geographically critical juncture on the international border. Some of the city's most pressing fracture points might be addressed if only this district could come to be seen by a plurality of the city's many constituencies as common ground, instead of as a foil

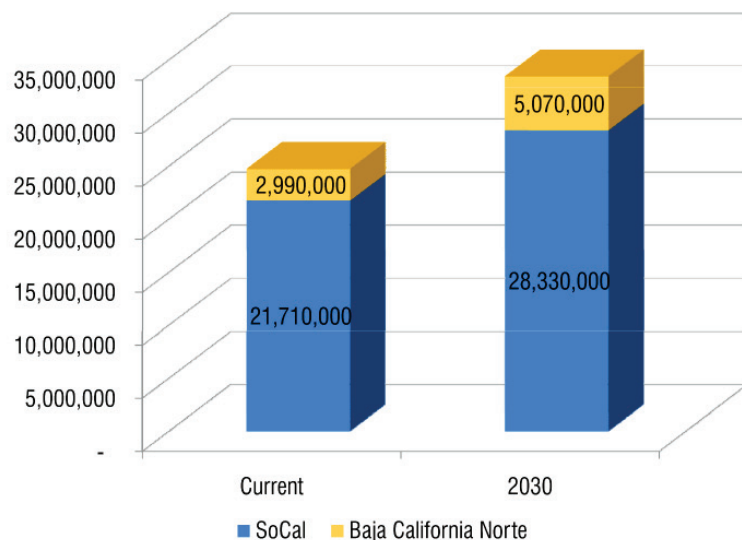
for the city's demographic, political, economic and cultural conflicts.

Resolving these conflicts on Otay Mesa is all the more critical because of population growth in the face of critical land and resource scarcity. In a metropolitan area that is already strained to the limit in terms of resource and space capacity, the population is expected to increase by nearly two and half million people over the next quarter century, largely

due to internal reproduction. The population of San Diego/Tijuana in the broader megalopolitan region of economically and culturally interrelated cities, which Dear (2003) called Baja California²³, is projected to grow from 24 million to 33 million:-- the addition of nearly two Houston Metroplexes, or two Ahmedabads.

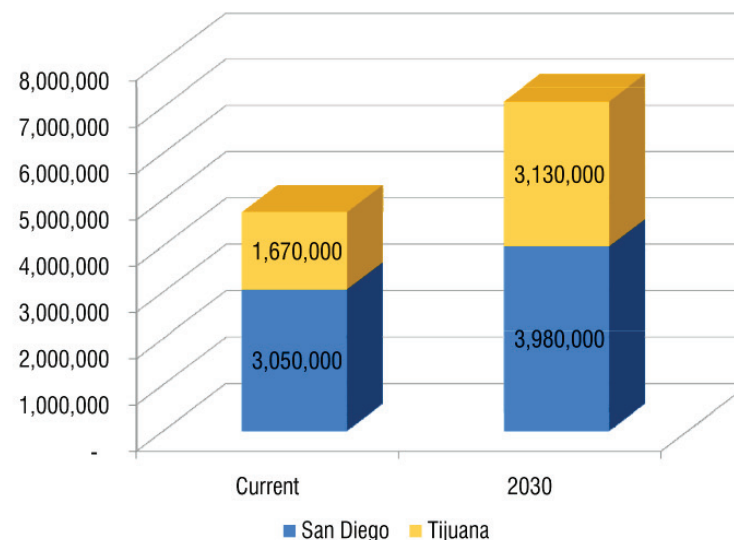
²³ Baja California comprises LA and its metropolitan hinterland, metropolitan San Diego/Tijuana, Tecate, Ensenada, and Mexicali (Dear, 2003).

MEGALOPOLITAN URBAN REGION POPULATION



data from SCAG, "Recent Trends in Population and Households", 2005; SANDAG, "2030 Regional Growth Forecast", 2006; and CONAPO, "Proyecciones de la Población de México 2005-2050", 2005; Mexican data are presented without consideration for the floating population

METROPOLITAN AREA POPULATION



data from SANDAG, "2030 Regional Growth Forecast", 2006 and CONAPO, "Proyecciones de la Población de México 2005-2050", 2005; Mexican data are presented without consideration for the floating population

All this will occur in a region fraught with cultural, ethnic and socio-economic tension, with an aging infrastructural frame, and with a water supply that is already stressed to or beyond its sustainable limit. In short, the region faces a set of crises, and it is argued here that Otay Mesa could provide part of the solution.

Otay Mesa is well-positioned to be a prototype for new forms of urbanization that will better serve its city and its region:-- its unique geographical and economic position at the gateway between the two geographic and political Californias and the unique symbolism it provides for the idea of cultural integration, or, perhaps, hybridization, provides it with significant comparative advantages as a catalyst for positive change.

The following chapter develops this idea into an actual proposal (“vision plan”) for transformation that takes into account the three agents of change acting within the district today:-- empire, the locality, and conservationists.



reTRANSFORM

design concept

agents & intentions

frames & matrix

strategies & tactics

DESIGN CONCEPT

Intentions

The anonymous, functionally separated, socially and culturally fragmented zones of industry and mass housing presently contemplated for the US side of Otay Mesa do little to reduce the sense of it as a pass-through place of danger and conflict. Otay Mesa deserves to be more than, severally, a guardhouse, a workshop, a parking lot, a dormitory, and a collection of infrastructures.

A new prototype inclusive, mixed-use, multifunctional, flexible and multi-layered urbanism is required by San Diego/Tijuana, for Otay Mesa.

The lack of natural resources constrains Otay Mesa's future development, so any future requires that natural resources be conserved and developed for maximum sustainability. Complete self-sufficiency with respect to water and power may not be possible, but neighborhoods should leverage infrastructure, technology and lifestyles to become as self-sufficient as possible. This takes the form of field-scale infrastructures for renewable water and energy and eco-industrial techniques for the recycling and reuse of industrial by-products

and building materials. Future communities should be reconnected to the region's watersheds in such a way as to ensure the health of this life-enabling system. Habitats and green spaces may be sustainably conserved in the face of inevitable urbanization, and settlement areas and infrastructural systems, including the BIS, should exploit a green frame of open spaces to improve quality of life. Finally, natural systems do not respect the BIS as a barrier and require autonomy from it.

Advanced industrial logistics require integrated and multimodal access systems designed on a site scale and with regional applications in mind. Such systems require a bottom-up reshaping of landscapes and infrastructural frames. The most competitive firms desire production spaces which are attractively configured, and deployed for maximal flexibility to accommodate inevitable changes in technology and global supply chains. Critically, these spaces should be connected to infrastructural systems that permeate through the BIS. The border is where San Diego/Tijuana's future will be made, and to enable that future, the city needs to provide an infrastructural frame for it.

Otay Mesa's location anticipates its future as a center for all aspects of border industry, with respect to innovation, exchange, education, administration and culture. Industry and the trade which accompanies it are the most positive ways in which Tijuana and San Diego interact at its border interface. This strength should be leveraged to create spaces which deepen, harmonize and hybridize the physical connections between the two halves of the city. Otay Mesa should become a place where people come as opposed to one where they merely pass-through.

Design interventions are required which facilitate industrial development, commerce and housing at close proximity and in such a way that promotes exchange between programs and peoples: (i) for limited income households whose members constitute a majority of the district's present and future workforce and for whom transportation is a primary constraint; and (ii) to minimize the need for new metropolitan-scale transportation/commutation infrastructure. Additionally, the creation of attractive places for living and working further contributes to the district's competitiveness as a global production center. Settings for liv-

ing and working may be designed to be conducive to the generation of an inclusive sense of community and a hybrid identity for Otay Mesa. Even if people cannot physically permeate through the BIS without restriction, their ideas and cultures should.

The demands of the central state for a secure border are an intrinsic part of Otay Mesa, but these demands should be successfully translated into a physical form that permit their coexistence with urbanism and the wishes of the people of San Diego/Tijuana. Infrastructures of containment, control and defense should be successfully integrated with the systems for living, working, production, conservation and exchange.

The prototype Otay Mesa shall respect, and, perchance, will transform the intentions of the locality and the state and the constraints of the environment.

Conceptual Basis

Rem Koolhaas, in *Small, Medium, Large, Extra Large* (1998), described how infrastructure may be imbued with strategic value through the attachment of "programmatically identities" (365) -- or agendas for their use, which arise out of the physical

form of the infrastructure in question, but which, once added and activated, may transform the nature of the infrastructure. By this process, even a border security wall could be transformed into something with new and useful qualities. The Block 4 houses, Koolhaas' proposed intervention on the Berlin Wall at Friedrichstrasse, are a case in point, where the form of the apartments was shaped by their relationship to the wall, forming new public and private spaces, such as courtyards, moments of exchange and so forth. Houses located in relation to the wall provided the adjacent sections of wall with a discernible programmatic identity, as courtyard walls and so forth, which, in turn, imbued the wall itself with a new interpretation, identity and meaning.

A larger scale and more contemporary example of this concept may be found in van Kuilenberg's (2006) infrabodies and infrabundles -- structures in which infrastructure and urban materials from existing landscapes are fused together to create hybrid forms, like landscape architecture that integrates infrastructural elements. Neighboring landscapes or conditions, such as dense city districts, particular types of open space, other infrastructures, *et cetera* trig-

ger particular changes or responses in these hybrid infrastructural forms. For example, a hybrid infrastructure may constitute a highway viaduct with buildings set into its structure, surrounded by a range of contextual conditions that range from fields to villages. When the highway meets, say, a village, the viaduct may ramp down to ground level, permitting traffic to enter or leave the structure. The village would serve as the "trigger" condition which causes a variation in the shape of the infrastructure, in much the same way that Koolhaas' Block 4 houses may effect a change in the structure of the Berlin Wall.

Cruz (2002) once suggested something similar to the viaduct example when, commenting on the conditions to the west of the site, in San Ysidro. He noted that infrastructural systems in the border area, like highways, tend to pass over the residential neighborhoods most proximal to POEs, and speculated about how such infrastructure may be transformed in response to these neighborhoods and otherwise used as an active organizing principle to improve communities they historically just run over.

Such interventions evoke the "Infrastructural urbanism" of Stan Allen

(2002), where infrastructures set boundaries, establish convergence points, provide departure points and frameworks for future programs, organize and manage flows, movement and exchange, and otherwise transform or adjust themselves to accommodate local contingencies and facilitate overall continuity. Infrastructure is treated as a generator and regulator of form:

Infrastructural work recognizes the collective nature of the city, and allows for the participation of multiple authors. Infrastructures give direction to future work in the city not by the establishment of rules or codes (top down), but by fixing points of service, access and structure (bottom up). Infrastructure creates a directional field, where different architects and designers can contribute, but it sets technical and instrumental limits to their work. Infrastructure itself works strategically, but it encourages tactical improvisation... although static in and of themselves, infrastructures organize and manage complex systems of flow, movement and exchange. Not only do they provide a network of pathways, they also work through systems of locks, gates and valves -- a series of checks that control and regulate flow... Infrastructures accommodate local contingency while maintaining overall continuity... Infrastructural systems work like artificial ecologies. They manage the flows of energy and resources on a site,

and redirect the density and distribution of habitat. They create the conditions necessary to respond to incremental adjustments in resource availability, and modify status of inhabitation in response to changing environmental conditions (Allen, 2002).

Thus infrastructural frameworks are used to establish the boundaries of matrices comprising of spaces, fields and programs, setting the limits of such matrices and managing how exchanges occur between the fields.

It is possible to conceive of the Otay Mesa site as a skeletal framework of large infrastructural systems, where infrastructure is defined as "lines in an urban territorial system that direct future organization" (Guasa, 2003) of the land, by providing structure and guidance (for any future development) with regard to form, velocity and sequentiality.

The BIS, with its embedded and flanking components, including the wall itself, the POEs, berms, exclusion zones and parallel roads, constitute one such system:-- a linear backbone for the site. The site's hierarchical transportation access network, with interstate highway, truck access roads, passenger vehicle

access roads and, prospectively, rail and trolley/tram loops constitute a second system. The green network, which at present is more of an exoskeleton defining the site's periphery, but which could be developed into something else with interior spokes, corridors and other structures, constitutes a third system. These three systems are, of course, highly specialized programmatically, each on their own designed to serve the respective needs of the site's three primary constituencies of state security, local economy and environmental conservation; however, taken together in this manner, they might, in addition, become something else:-- a new, hybrid construct. The three systems may be imagined to fold and weave into each other in various ways, forming a functional and, to an extent pre-programmed, three-dimensional frame of infrastructure enveloping an irregular two dimensional grid of interstitial voids.

Taken together, the voids comprise a complex matrix of spaces or fields into which urban development programs may be inserted, as required subject to the overall strategies and to specific tactical trigger conditions. The programs: -- or rather the mix of

programs -- might differ considerably from field to field as a function of their relative position in the matrix and their relationship to the infrastructural elements that segregate or connect them. For example, fields that are bounded by access points to container trucks and freight-rail systems might tend to house heavy Industrial and logistics programs. Fields that are bounded by combinations of green open space and the surface street network might tend to contain homes, schools and related services. Fields between these first two types of fields might tend to contain commercial, office, light industrial and loft housing programs. Any field near the BIS wall might tend to host modifications of these programs. Possible examples include a transloading facility for containers moved through a permeability point in the wall on a conveyor system or, alternatively a commercial field catering to cross-border trade and exchange, with patrons passing through an adjoining pedestrian and passenger-vehicle-oriented POE. Adjacencies to a given field would determine edge conditions or interventions, to provide adequate buffering against noise, fumes, children or whatever else might be emanating from adjacent areas.

These matrix fields would function like the development zones in Koolhaas' Ville Nouvelle Melun-Sénart proposal which sought to derive buildable areas on a vast suburban site through a process of elimination or deduction (Koolhaas, 1998). Certain areas, "void spaces," would be protected against "contamination by the city" by designation as open or green or infrastructure. These "void spaces" themselves formed figures or what Koolhaas called "controlling elements": -- effectively a framework of green infrastructure defining a set of residual spaces into which built programs may be inserted, subject to adjacency trigger conditions, proximities or just whimsy. Built areas, which in the Ville Nouvelle case included villages, office and industrial estates and big-box store areas, were "framed" by the conserved void space.

The resulting web of neighborhoods suggest network-like connectivity or circuits of activity:-- what Koolhaas (2003) termed "programmatic ecologies" (where program specifics are, at least partially, defined by the nature of adjacent infrastructural systems). This is similar to what deGeyter (2002) described as suburban areas where fragments, following pre-

scribed rules, rearrange themselves around infrastructure or green space (hybridizing into each other and into framework elements); or what Guasa (2003) called dynamical urban systems: -- grids that hybridize between infrastructure and architecture, producing what he termed "operational landscapes"¹ (where infrastructure, landscape and urbanism may maintain a "parasitic coexistence of structures and identities").

This approach may create a more complex and dynamic urban *totality*, suitable for the site's contradictory conditions and multiple agent agendas, than, say, Calthorpe's transit oriented design standards (2003, 2002) adopted by San Diego for its "Urban Land Use Guidance System" (Calthorpe, 2002). By treating both infrastructural/environmental fields and programmatic systems as objects for design and programming, this approach allows the two types of systems to hybridize into each other, creating a new type of operational landscape for Otay Mesa.

The conceptual scheme is summarized in *Diagram A* below.

¹ "Landscapes operationalized for use, function and architecture that simultaneously demonstrate natural and artificial conditions" (Gausa, 2003, 384).

CONCEPTUAL DEFINITIONS

FRAME

N 1: A STRUCTURE SUPPORTING OR CONTAINING SOMETHING [SYN: FRAMEWORK, FRAMING]
2: THE HARD STRUCTURE (BONES AND CARTILAGES) THAT PROVIDES A FRAME FOR THE BODY OF AN ANIMAL [SYN: SKELETAL SYSTEM, SKELETON, SYSTEMA SKELETALE]
3: THE INTERNAL SUPPORTING STRUCTURE THAT GIVES AN ARTIFACT ITS SHAPE; "THE BUILDING HAS A STEEL SKELETON" [SYN: SKELETON, UNDERFRAME]
V 1: ENCLOSE IN OR AS IF IN A FRAME; "FRAME A PICTURE" [SYN: FRAME IN, BORDER]
2: ENCLOSE IN A FRAME, AS OF A PICTURE

MATRIX

N 1: A RECTANGULAR ARRAY OF ELEMENTS (OR ENTRIES) SET OUT BY ROWS AND COLUMNS
2: AN ENCLOSURE WITHIN WHICH SOMETHING ORIGINATES OR DEVELOPS (FROM THE LATIN FOR WOMB)
3: THE BODY SUBSTANCE IN WHICH TISSUE CELLS ARE EMBEDDED [SYN: INTERCELLULAR SUBSTANCE, GROUND SUBSTANCE]
5: MOLD USED IN THE PRODUCTION OF PHONOGRAPH RECORDS, TYPE, OR OTHER RELIEF SURFACE

CELL

N 1: ANY SMALL COMPARTMENT; "THE CELLS OF A HONEYCOMB"
2: THE BASIC STRUCTURAL AND FUNCTIONAL UNIT OF ALL ORGANISMS; CELLS MAY EXIST AS INDEPENDENT UNITS OF LIFE (AS IN MONADS) OR MAY FORM COLONIES OR TISSUES AS IN HIGHER PLANTS AND ANIMALS

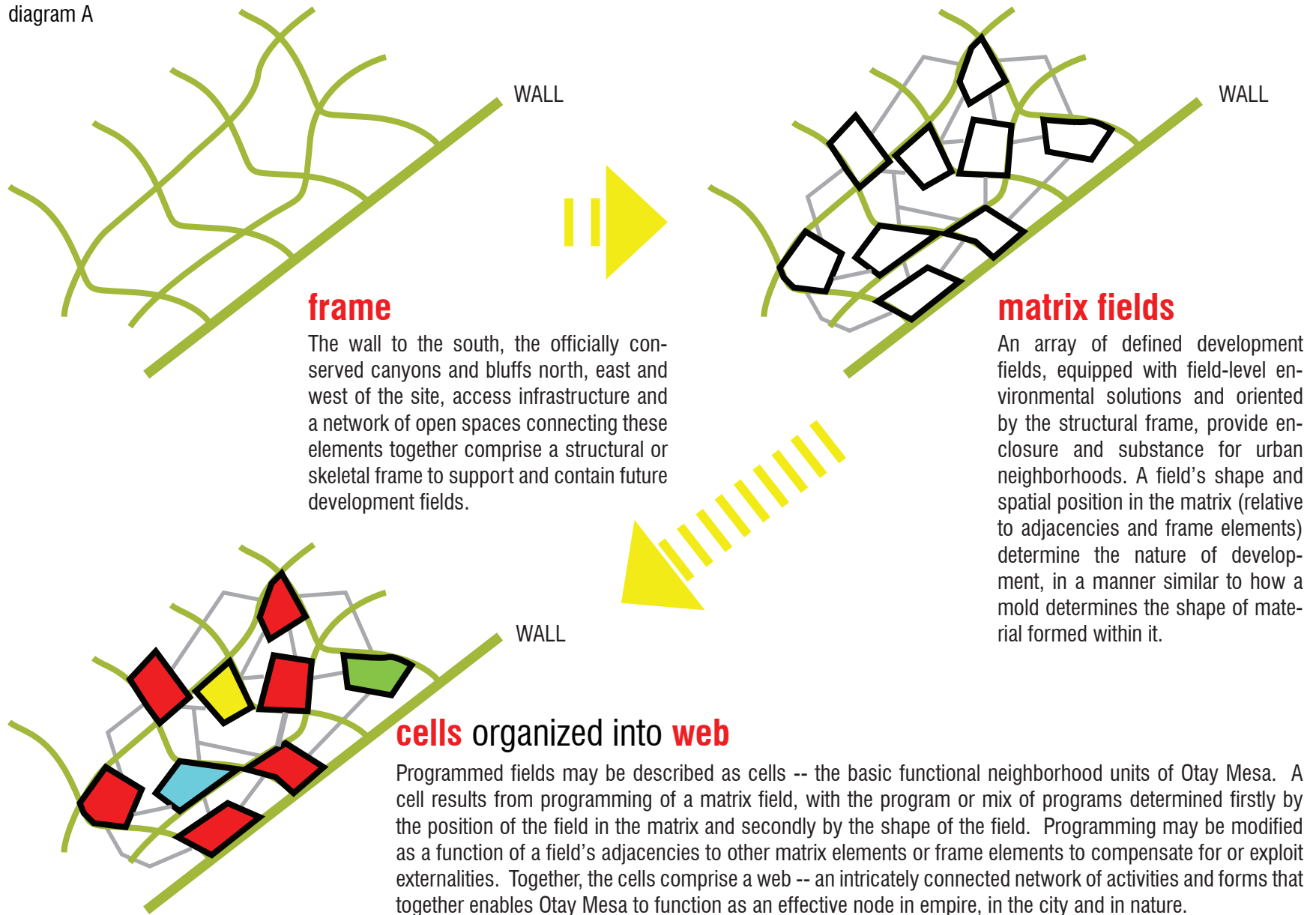
WEB

N 1: AN INTRICATE NETWORK SUGGESTING SOMETHING THAT WAS FORMED BY WEAVING OR INTERWEAVING; "THE TREES CAST A DELICATE WEB OF SHADOWS OVER THE LAWN"
2: AN INTRICATELY CONNECTED SYSTEM OF THINGS OR PEOPLE; "A NETWORK OF SPIES"; "A WEB OF INTRIGUE" [SYN: NETWORK]
V : CONSTRUCT OR FORM A WEB, AS IF BY WEAVING [SYN: NET]

Source: WordNet (r) 1.7

CONCEPTUAL SCHEME

diagram A



AGENTS & INTENTIONS

As previously described, non-agricultural physical and programmatic development on Otay Mesa today may be described in terms of agents whose agendas group them naturally into three broad categories: (i) “imperial” agents, (ii) “local” agents, and (iii) “conservation” agents; examples of agents in each of these categories are included in *Diagram B*. These agendas are translated into development strategies which, in turn, shape the use of space on the *mesa* in often contradictory ways.

“Imperial” agents are defined simultaneously in the traditional and the Hardt and Negri (2000) senses, to include the central governments of the United States and Mexico and their agents, including, in particular, the US Department of Homeland Security and the distally-controlled transnational corporations that either ship goods through the site or participate in production activities in the region.

“Local” agents include a diffuse range of local and regional commercial, humanitarian and government interests that generally cooperate, but sometimes conflict, with regard to the site’s development. In

Diagram B, these include, but are not limited to (*from top left to lower right*), the Otay Mesa Chamber of Commerce; the San Diego Regional Economic Development Corporation; the State of California; SANDAG; the South Bay Economic Development Corporation; private real estate developers like Sunroad Enterprises, which own and develop land in Otay Mesa; non-governmental organizations and community development corporations like Casa Familiar; the *ayuntamiento de Tijuana*; and the City of San Diego.

“Conservation” agents include (*Diagram B, from left to right*) the California Coastal Commission, the various governmental agencies that form the MSCP and private non-governmental organizations like the Sierra Club and the Nature Conservancy.

Agent Behavior

The behavior of these agents with respect to the *mesa* affect development, and may be characterized in terms of the following dimensions:-- reactivity/direction of authority, flexibility of strategies and strategic horizon, as illustrated in *Diagram C* below.

For example, “imperial” agents gen-

IMPERIAL



LOCAL



CONSERVATION



diagram B

erally impose their agendas on the *mesa* from national capitals and global commercial centres, through the application of centripetal and unidirectional authority. Implementation mechanisms include powers of decree, condemnation, national security directives, legislation, and, on the part of the private agents, large-scale purchases of land and intensive lobbying of national officials. Their strategies tend to impact site systems and building programs at large scales, and they tend to be relatively inflexible to local and site conditions. Strategies may change frequently and quickly, based on changes in the political environment and in world markets.

For their part “local” agents must interact with (and negotiate with) one another and with the other types of agents in a highly decentralized manner, to reflect their agendas in Otay Mesa’s physical form. For example, municipal governments may, through complex public participation mechanisms, try to reflect the programmatic objectives of local constituencies in consensus land-use plans. Private developers may attempt to interject their commercial interests into these decision processes as one constituency. Non-governmental organi-

zations may push social housing agendas, in the same manner, as another constituency. Chambers of commerce and economic development authorities may try to reduce barriers for companies seeking to develop property on the *mesa*. Transient alliances and rivalries among these agents are not uncommon. In general, unlike the imperial agents, no one local agent has the ability to unilaterally make form-making decisions across the entire site. As a result, their strategies tend to impact site systems and building programs at small and intermediate scales, and only progressively over time.

“Conservation” agents tend to use empirically-based criteria and assessments of the quality of and risks to natural systems to make hedonically-based policy recommendations. Power is asserted through mechanisms such as habitat protection and conservation legislation, lawsuits, lobbying, education and, sometimes, direct intervention in land markets. Strategies frequently involve large areas, encompassing but extending beyond the site. In general, such groups tend to work, severally, in cooperation with local governments and other local agents, cutting across scales as required to

encapsulate natural systems. Strategies require significant planning, and thus typically allow for less flexibility than those of local agents. Project horizons tend to be long.

Programmatic Intentions

Agents’ programmatic intentions may be assessed along a range of themes:-- (i) cross-border exchange; (ii) economics; (iii) access; (iv) manufacturing/production; (v) residential population; and (vi) ecological/environmental intentions. These intentions are summarized in the second diagram below. Programmatic intentions in each of these themes are rated, on a relative scale based on their importance to the agent type in question. For example, “imperial” agents are largely indifferent to cross-border commercial, social, resource-based and cultural exchanges (*rated 1/5*), while local agents are very interested in facilitating them (*rated 4/5*). Conservation advocates are, for the most part, only interested in a subset of possible exchanges (*rated 3/5*). These programmatic intentions are summarized in *Diagram D* below.

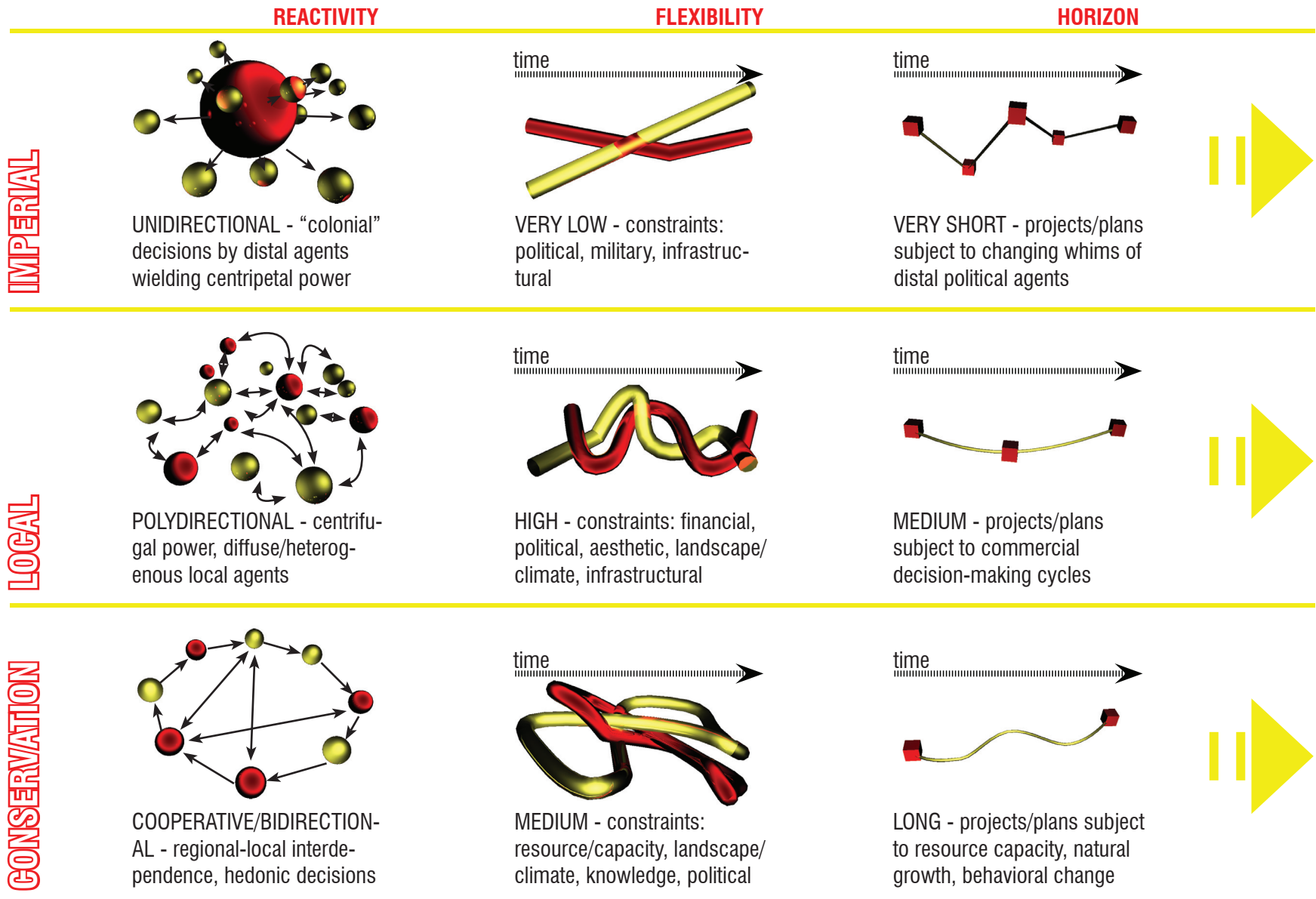
Formal Expressions

Up until the present time, the mutually exclusive programmatic intentions of the three agent types have

been translated into separate physical strategies realized in mutually exclusive formal typologies. With sufficient land on the *mesa*, the agents were able to deploy their strategies independently of one another, without having to resort to any systematic tactical moves to accommodate points of intersection or lines of adjacency between these formal solutions.

These autarchic forms are described in the *Diagram E* below. Formal typologies are grouped in terms of: (i) scale, (ii) grain and texture, and (iii) form.

Scale ranges from relatively small-scaled local developments:-- industrial estates/warehouse and workshop developments, housing tracts and the like; to medium-to-large-scale imperial developments:-- field-scale customs stations and detention centers, possibly ranging up to a kilometer in length, and the site-scale BIS; to large-scale conservation developments, with MSCP conservation areas creating a green curtain around the entire site and interconnecting with a necklace of conserved parkland extending throughout the metropolitan area. On a slightly smaller scale, constructed wetlands



AGENT PROGRAMMATIC INTENTIONS

diagram D

	EXCHANGE	ECONOMICS	ACCESS	PRODUCTION	POPULATION	ECOLOGY
IMPERIAL	security - border exchange is bad selective efficiency	footloose capital consumption facilitation	management of through-traffic international trade facilitation	collapsing space/globalizing supply chain market integration	workforce homogenization/control workforce cost minimization residents not desirable	barriers to other development conservation policies
	● ○ ○ ○ ○	● ● ● ○ ○	● ● ● ● ○	● ● ○ ○ ○	○ ○ ○ ○ ○	● ○ ○ ○ ○
	LOCAL	commerce - border exchange is good cultural/social integration & exchange	land scarcity/real estate taxation trade/production facilitation	mobility modal shift infrastructure city logistics containerization	protect/develop middle class jobs retention/expansion of mfg capacity "economic development" clusters	affordable/desirable workforce housing worker training attractiveness to workers
● ● ● ● ○		● ● ● ● ●	● ● ○ ○ ○	● ● ● ● ●	● ● ● ○ ○	● ● ● ○ ○
CONSERVATION		re-connection of natural systems divided by border wall coordination to manage int'l resources, waste, emissions	ecological resource management ecological systems health/value (green cover, water, habitats)	mass transit vehicle emissions minimization reduce unnecessary travel/truck circuits	green logistics/sustainable supply chain industrial ecology/material lifecycle management	environmental justice resident/worker health habitation density/work proximity
	● ● ● ○ ○	● ● ○ ○ ○	● ● ● ○ ○	● ● ● ○ ○	● ● ● ● ○	● ● ● ● ●

AGENT FORMAL EXPRESSIONS

SCALE

GRAIN/TEXTURE

FORM

IMPERIAL



large irregular building complexes arranged around regional or field-scaled infrastructure

Google Earth, 2006



Annie Nimmety, SDIMC, 2006 (by-nc-sa)



Peter Gibbs (by-nc-sa)



California Department of Transportation, 2006



“military urbanism” - large scale infrastructure and building complexes, with little to no formal regard for landscape/terrain or visual quality; housing comprises of barracks and detention facilities; roadworks pass-through the *mesa*

LOCAL



regular repetitive course-grained buildings arranged around regular or irregular street grids

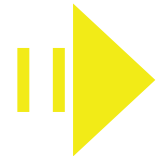
Google Earth, 2006



Grubb & Ellis, Britannia Crossing, 2006



Truestone Properties, New City, 2007



commercial real estate typologies for light-medium industrial, warehousing, big-box retail and residential programs; housing comprises multi-unit townhouses, densely-arranged single family patio homes and, recently, point tower proposals

CONSERVATION



organic landscape forms, embodying ecological systems, arranged across terrain

Google Earth, 2006



medium-to-large scale conservation and preservation areas, greenbelts, riparian canyon systems and, on the Mexican side, landscape-integrated water treatment systems (constructed wetlands and trickling systems)

diagram E

and other natural resource protection and rehabilitation areas may extend over dozens or hundreds of hectares, often with site or regional-scale linkages.

Grain, texture and form of developments also vary by agent type. For example, local agents have, in the past, used typically suburban formal strategies on the *mesa*, including parcelized industrial estate/ technology park-type developments featuring tilt-up steel frame “big boxes” and residential tracts featuring universally-accepted townhouse, condominium and patio home typologies, all interconnected with a grid of wide landscaped boulevards interlaced with regional limited-access highways. Virtually all “local agent” access infrastructure have been dual-use for both container-bearing trucks and passenger vehicles.

Consensus Intentions

Autarchic formal solutions for each agent type assume sufficient land on *mesa* for these different urbanization patterns to develop independently of each other. In this scenario, formal tactics to mediate land-use conflicts where different programs meet are generally unnecessary. However, this form of development will be-

come increasingly impractical as available land on the *mesa* becomes scarce. In the long-term, for the *mesa* to continue to densify while simultaneously accommodating varied agent agendas, consideration has to be given to the inevitable interactions between programs and formal strategies.

Programs may hybridize into each other at points or along adjacency boundary lines where such differing formal strategies encounter each other. Keeping these formal solutions and the programmatic intentions in mind, it is possible to graph the relative emphasis of each type of agent and the current status quo (*Diagram F* below), and, in anticipation of such a process of hybridization, derive from this graph a consensus amount of *change* in each program theme that an urban design plan might achieve for the district.

For example, imperial agents are, as previously noted, largely unconcerned about **cross-border exchange**; local agents, on the other hand, are very concerned about it; and conservation agents are somewhere in between. Based on this subjective graphing, a consensus intention may desire exchange, over-

all, to be improved, from its current low level (*i.e.*, suitable venues for exchange are largely limited to access infrastructure capable of reaching off-site destinations, a few strip malls and a large collection of *tianguis* on the Mexican side) to the much more prototypically urban exchange hub desired by many local agents. Such an urban design intention may implicate particular design strategies, such as creation of one or more mixed-use commercially-oriented centers, where exchange-oriented programs, like markets, conference centers, cultural venues or the like may be accommodated.

Similarly, one might derive, from this relativistic graphing, a programmatic intention to improve the district’s **economic** potential to levels closer to that desired by local agents. This might indicate strategies which develop more cross-border trade infrastructure capacity:-- more POEs, conveyor-based crossing systems for containers, rail terminals, air-freight terminals, *et cetera*.

Accommodation of the imperial (trans-national corporation) desires for easier through-traffic **access** and continued controls on permeability through the BIS (nation state), might

presage the development of expedited custom clearing facilities for pre-tagged containers and pre-screened corporations.

A desire to improve the district’s attractiveness to **manufacturers**, including *maquiladoras* producers, to levels closer to local agent preferences, may indicate the need for freight villages, advanced supply chain and logistics infrastructure, and cross-border resource exchange nodes.

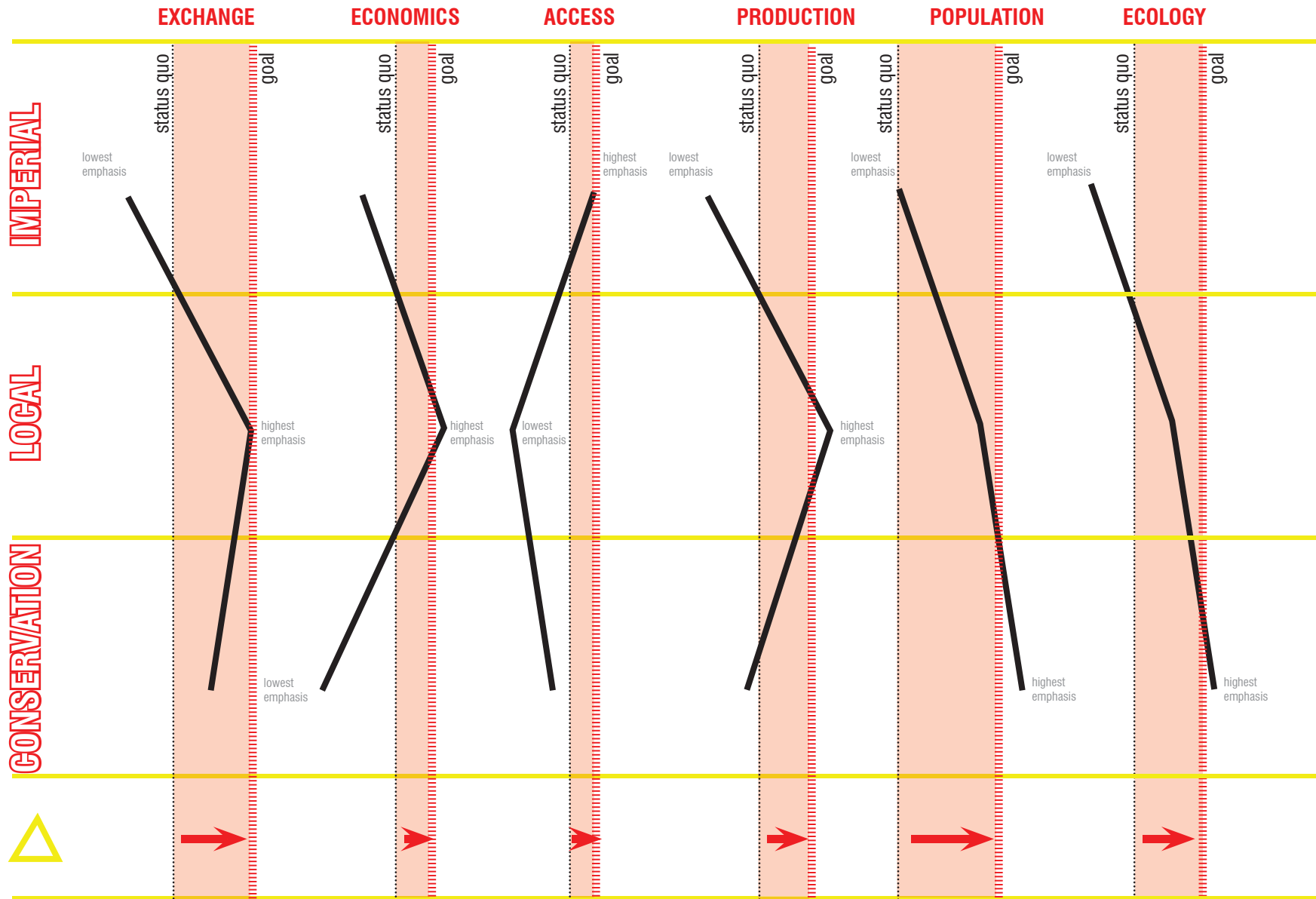
The local agent desire to provide affordable and easily accessible housing for the worker **population** may indicate the need to increase and densify the district’s housing component.

The desire of conservation agents to protect the district’s habitats and **ecological** systems may indicate a need for site-scale hydrological and habitat conservation solutions to augment the peripheral MSCP greenbelt.

This relativistic assessment of agent intentions is, of course, subjective, but, once abstracted into a consensus for each theme across all of the agent classes, may become the basis of a programmatic agenda for

diagram F

CONSENSUS INTENTIONS



the district's transformation. This agenda may be used as a reference when developing and considering particular intervention strategies of the types described here.

Simultaneous optimization across all of these programmatic themes complicate the agent-in-isolation development model used to date. With land and resource carrying capacity constrained, formal strategies and built forms (as well as the programs themselves) will have to overlap, interact and hybridize as they come into increasingly frequent, and possibly uncomfortable, contact with one another. Different framework infrastructural systems will have to coexist and intertwine with each other, landscape elements and the built matrix of developable land, to form new types of spaces. The result of these interactions may be something like the multifunctional, multi-layered "operationalized landscape" structures envisioned by Gausa (2003) or the "programmatic ecology" type envisioned by Koolhaas (2003), both of which are discussed earlier in this chapter.

FRAMES & MATRIX

Given these intentions, and the consequences which will inevitably arise from their simultaneous deployment, infrastructural and landscape elements sought by the different agents may be associated with infrastructural frames:-- the wall and its associated systems (BIS); access infrastructure, including roads at all hierarchical levels, POEs, highways, and so forth; and the MSCP greenbelt (agent intentions map to frame types in the manner shown in *Diagram G* below). As the site develops, these infrastructural frames may be expected to become inter-related in various ways this "vision plan" seeks to inform, giving the site figural structure and a designed landscape. As described in detail in the reSTRUCTURE chapter, each frame will be further augmented as the plan is developed, with their respective end-states shown in *Diagram H* below.

As previously described, the interstitial spaces formed by the overlaid frames will comprise a matrix of developable fields. These fields may be characterized as being oriented toward one of several activities:-- (i) production/logistics emphasis or (ii)

housing and commercial emphasis. A third type of area will flex between those two program orientations subject to market conditions.

Field types, by these tendencies, are illustrated in *Diagram J* below.

STRATEGIES & TACTICS

In the "vision plan" urban design strategies are linked to each of the three infrastructure frames and to the matrix. These strategies, which are organized into the general themes used to characterize agent intentions, are described in *Diagrams I and K* below. Strategies determine the primary form of each frame and the matrix fields. These strategies are further described in the reSTRUCTURE chapter.

Tactical accommodations affect how strategies are implemented; they are "triggered" when one or more of three possible boundary conditions occur: (i) frames intersect with one another or, in the case of the access frame, with itself at points or along adjacency lines; (ii) matrix fields intersect with or border frames along adjacency lines; and (iii) matrix fields border other matrix fields along adjacency lines, with or without a frame

as a boundary or mitigating element. The general form of these tactical accommodations are described in *Diagrams L, M and N* below, for each of the three boundary conditions, respectively. These tactics are given further treatment in the reSTRUCTURE chapter.

Matrix fields become neighborhoods along programming and urban design guidelines discussed in the rePROGRAM and reFUSION chapters. An example of programmed fields (referred to in *Diagram A* above as cells) as they relate to matrix field types, is given in *Diagram O* below.

AGENT - FRAME MAPPING
diagram G

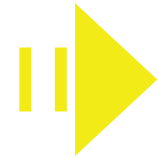
IMPERIAL



LOCAL



CONSERVATION



PROJECTION OF INTENTIONS

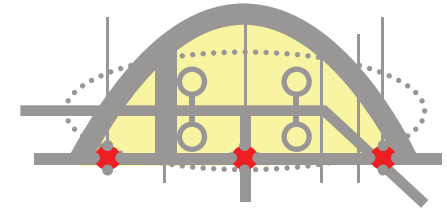
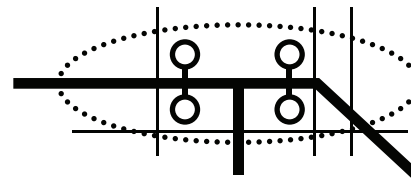
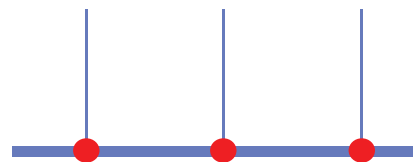


WALL

ACCESS

GREEN

MATRIX



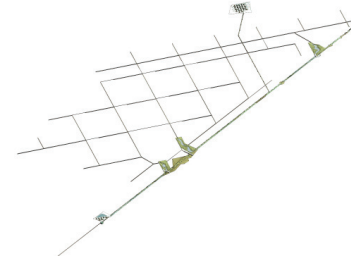
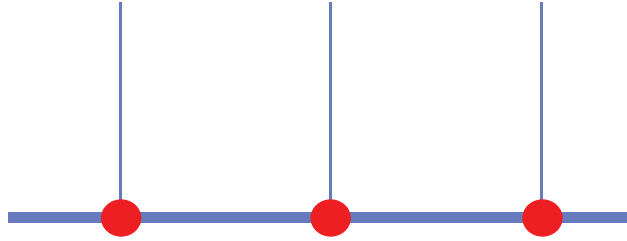
frame

frame

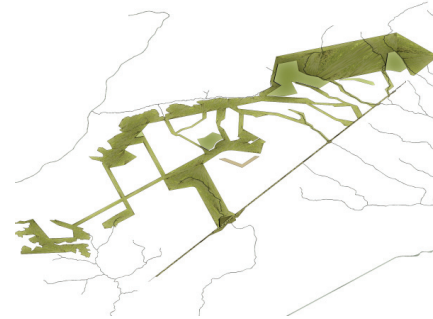
frame

matrix

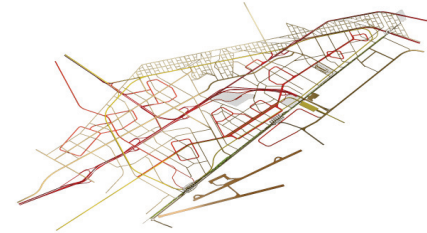
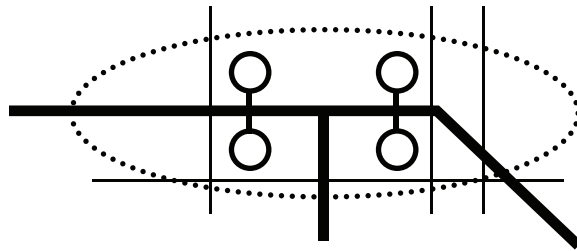
WALL



GREEN



ACCESS



FRAMES

STRATEGIES

diagram I

EXCHANGE

ECONOMICS

ACCESS

PRODUCTION

POPULATION

ECOLOGY

WALL

Increased permeability for freight, resources & not restricted to POEs

Reduce crossing wait; increase capacity throughput

Facilitate through-traffic for passenger/freight vehicles, pedestrians, resources through congestion-alleviation & permeability measures

Link industrial and commercial areas on both sides of the POE

Infrastructure design to facilitate development possibilities at/near POEs

Re-connect ecosystems separated by the wall through stream corridors

POE infrastructure designed to facilitate exchange activities

Infrastructure design to facilitate commercially-attractive economic activities closer to the wall, reducing "no man's land"

Allow movement of production factors through wall outside of POEs

Transform exclusion-zone between parallel walls into water garden, integrated into site waterworks



GREEN

Facilitate cross-border resource/material exchange opportunities

Reduce environmental impact of urbanization, in terms of 1) loss of green cover; 2) water withdrawals; 3) carbon additions; 4) industrial contaminants/contaminated water

Decrease atmospheric carbon additions from trucks, cars by 1) minimizing commutes/truck circuits; 2) developing rail links, container-movers; 3) promoting mass transit

Buffer and boundary-delineate industrial areas with green spaces

Provide healthy environments for living, working, recreation

Restore & reconnect sage scrub, riparian habitats

Use conservation areas as a barrier to development of MSCP zones

Integrate waterworks with other systems



ACCESS

Develop transportation infrastructure to facilitate border exchange and linkages for freight rail, passenger vehicles, pedestrians & sealed shipping container (with tracking capability)

Facilitate development of industry and advanced inland logistics by providing for dedicated, grade-separated truck/container access loops

Develop South Bay BRT right of way

Provide infrastructure for through-traffic/freight & for local supply chain requirements

Provide adequate parking facilities

Provide for passenger mass transit

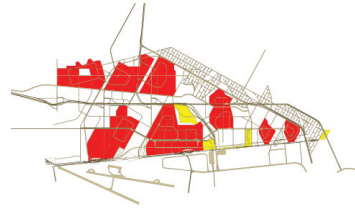
Protect passenger vehicle access from trucks

Provide for cross-border movement of materials/industrial lifecycle by-products/recycled water

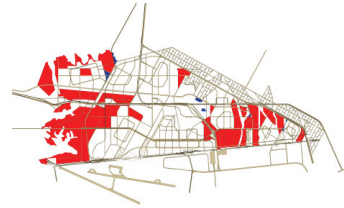
Promote green logistics & mass transit



FRAMES



PRODUCTION/LOGISTICS



FLEXIBLE



COMMERCIAL/RESIDENTIAL

EXCHANGE	ECONOMICS	ACCESS	PRODUCTION	POPULATION	ECOLOGY	STRATEGIES
<p>POE areas as exchange sites</p> <p>Pedestrian-oriented POE design with adjacent urban services</p> <p>Matching of such mixed-use areas on both sides of the wall, at POEs</p>	<p>Commercially-attractive economic activities at the wall, particularly at POEs and other permeability points</p> <p>Mixed-use areas for light industrial and big-box commercial programs; dedicated areas for advanced logistics and heavier industrial programs</p>	<p>Provide areas designed to host advanced facilities for freight containerization, modal shifts, inland transloading, city logistics</p> <p>Transit-oriented development principles applied in general</p>	<p>Provide for coordination of industrial development on both sides of wall, with adequate land with POE access</p> <p>Provide adequate development areas for industry, but also provide sufficient flexibility for industrial areas to be re-used or “flexed” into other programs under various economic scenarios</p>	<p>Place commercial, retail, hospitality programs adjacent to wall at POEs</p> <p>Improve safety/security by creating legitimate activity centers along wall, including residential areas</p> <p>Increase habitation density/work proximity, with due respect for housing affordability</p>	<p>Develop self-contained “eco-industrial neighborhoods” with shared field-level cogen/solar, water/waste mgmt/recycling, resource/material life-cycle exchange facilities</p> <p>Exploit topography and solar exposure in siting development areas</p>	

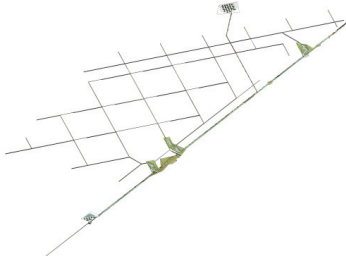
diagram K

TACTICAL TRIGGERS

WALL

GREEN FRAMES ACCESS

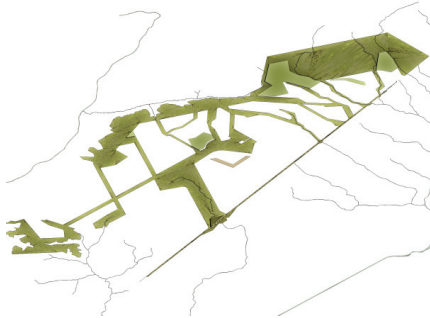
WALL



LANDSCAPE RISES TO WALL, WALL BECOMES A CONSTRUCTED LANDSCAPE RAVINE

WALL ADJUSTS FORM TO ACCOMMODATE ACCESS INFRASTRUCTURE, INCLUDING STATIONS, TERMINALS AND OTHER BUILDINGS AS REQUIRED

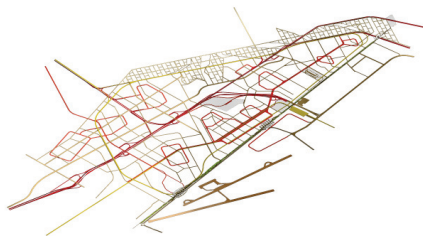
GREEN



STREAMS DIVERTED AND CULVERTED UNDER THE WALL, BEFORE ANY LANDSCAPE CHANGES TO ACCOMMODATE THE WALL

GREEN LANDSCAPE ADJUSTS FORM TO ACCOMMODATE ACCESS INFRASTRUCTURE BUT RETAINS ITS CONTINUOUS NATURE

ACCESS



DEPENDING ON THE MODE OF ACCESS, AN APPROPRIATE POINT OF PERMEABILITY BREACHES THE WALL

ACCESS INFRASTRUCTURE GENERALLY PASSES OVER THE GREEN FRAME VIA FLYOVERS, RAMPS, BRIDGES AND OTHER ACCOMMODATIONS

MODAL SEPARATIONS AS APPROPRIATE

GREEN FRAMES ACCESS

diagram L

TACTICAL TRIGGERS

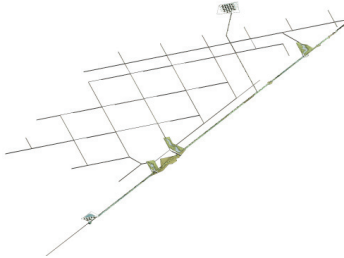
PRODUCTION

FLEXIBLE

COMMERCE/RES

MATRIX

WALL



YES

VISUALLY IMPERMEABLE
 PERMEABLE TO FREIGHT
 PERMEABLE TO WASTE/
 RESOURCES/DRAINING TO
 POWER GENERATION OK

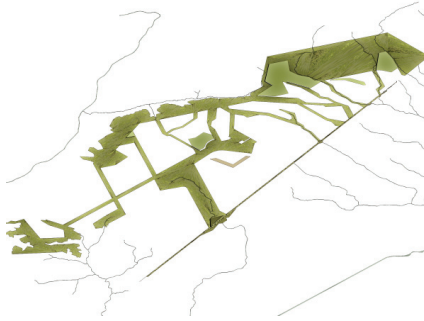
YES

VISUALLY SEMIPERMEABLE
 PERMEABLE TO CARS/
 PEDESTRIANS
 OPEN SPACE BUFFERS/
 DRAINING TO

YES

VISUALLY PERMEABLE
 PERMEABLE TO CARS/
 PEDESTRIANS
 PUBLIC PLAZA/PARK
 LIMITED DRAINING TO

GREEN



NOT PREFERRED

IMPERMEABLE
 LANDSCAPE DEPRESSION/
 SUBSTANTIAL BUFFERS
 NO DRAINING TO

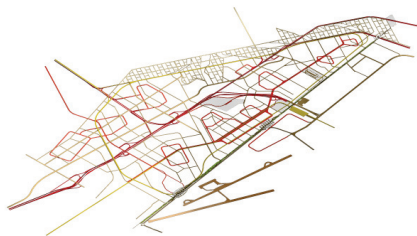
PERMITTED

SEMI-PERMEABLE
 BUFFERS w/ VIEW COR-
 RIDOR
 NO DRAINING TO

YES

PERMEABLE TO PEOPLE AT
 POINTS
 PROMENADE/RETAINING
 WALL
 LIMITED DRAINING TO

ACCESS



LOGISTICS
 ROADS + HIGHWAY ACCESS
 FREIGHT RAIL/FREIGHT
 TRAM/TRUCK/TROLLEY/
 CAR/CONTAINER
 RAMPS UP TO
 DRAINING FROM

SURFACE
 STREETS + HIGHWAY/
 LIMITED LOGISTICS
 FREIGHT TRAM/ CAR/
 TROLLEY/LIMITED TRUCK
 BUFFER TO HIGHWAY
 DRAINING FROM

SURFACE
 STREETS + HIGHWAY
 CAR/TROLLEY
 LANDSCAPE BUFFER TO
 HIGHWAY REQUIRED
 PEDESTRIAN FRIENDLY

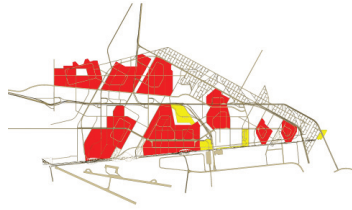
diagram M

TACTICAL TRIGGERS

PRODUCTION

FLEXIBLE **MATRIX** **COMMERCE/RES**

PRODUCTION



YES ATYPICAL

NO RESTRICTIONS BUT TYPICALLY ONLY OCCURS w/ FRAME INTERVENTION

YES

CONSTRUCTED LANDSCAPE BUFFERING REQUIRED

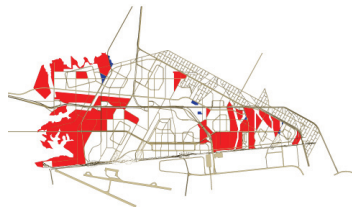
GRADE CHANGE COMMON/ PHYSICAL BDG CONNECTIONS POSSIBLE

NO CONDITIONAL

PARK w/ BERM+ FRAME INTERVENTION REQUIRED

GRADE CHANGE + BERM REQUIRED

FLEXIBLE



YES

CONSTRUCTED LANDSCAPE BUFFERING REQUIRED

GRADE CHANGE/BERM POSSIBLE

YES

CONSTRUCTED LANDSCAPE BUFFERING REQUIRED

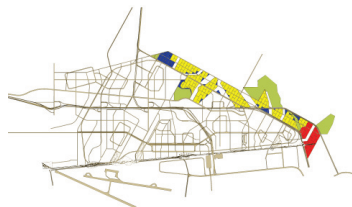
GRADE CHANGE COMMON/ PHYSICAL BDG CONNECTIONS POSSIBLE

YES

LANDSCAPE OR INSTITUTIONAL BUILDING BUFFERING REQUIRED

GRADE CHANGE COMMON/ PHYSICAL BDG CONNECTIONS POSSIBLE

COMMERCE/RES



NO CONDITIONAL

PARK w/ BERM+ FRAME INTERVENTION REQUIRED

GRADE CHANGE + BERM REQUIRED

YES

LANDSCAPE OR INSTITUTIONAL BUILDING BUFFERING REQUIRED

GRADE CHANGE COMMON/ PHYSICAL BDG CONNECTIONS POSSIBLE

YES

LANDSCAPE OR INSTITUTIONAL BUILDING BUFFERING REQUIRED

GRADE CHANGE COMMON/ PHYSICAL BDG CONNECTIONS POSSIBLE

diagram N



NEIGHBORHOOD
CELLS

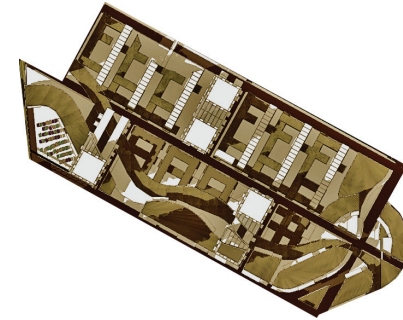
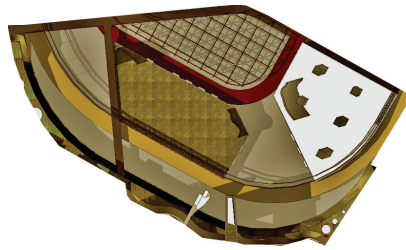
PRODUCTION

FLEXIBLE

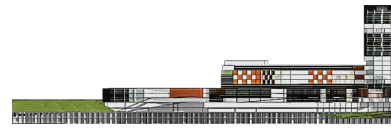
COMMERCE/RES

MATRIX

PLAN



ELEVATION



AXONOMETRIC

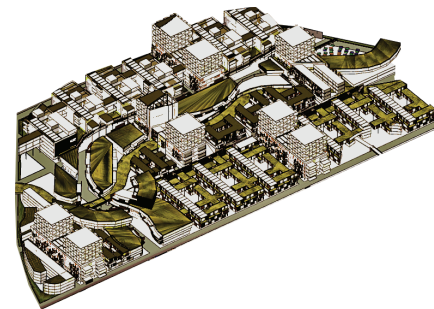
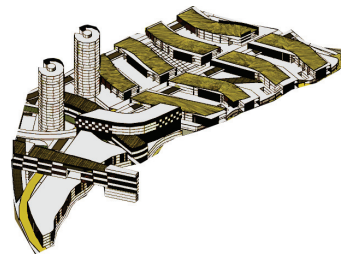
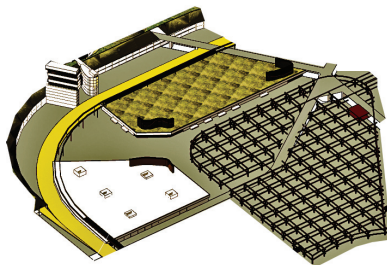


diagram 0

reSTRUCTURE

structure scheme

frame:green

frame:access

matrix of cells

GREEN FRAME



WALL FRAME



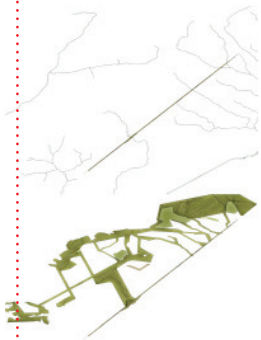
WALL+ FRAME



ACCESS FRAME



FIELD MATRIX

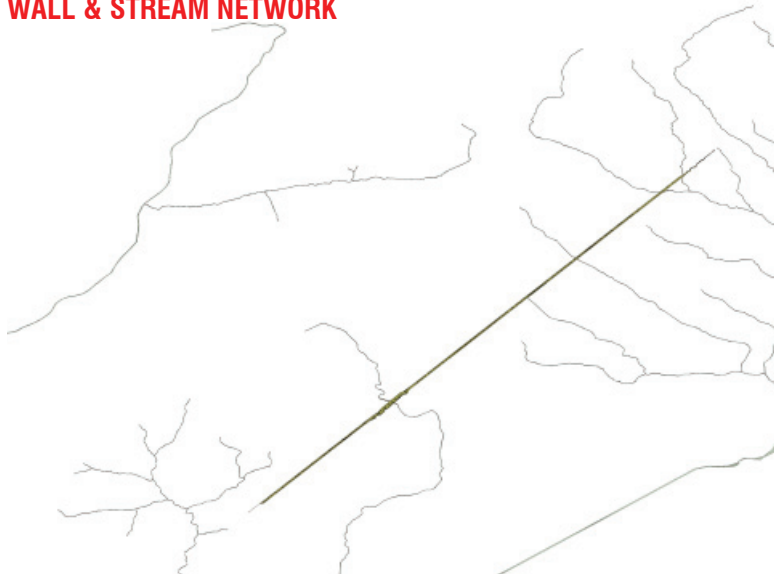


STRUCTURE SCHEME

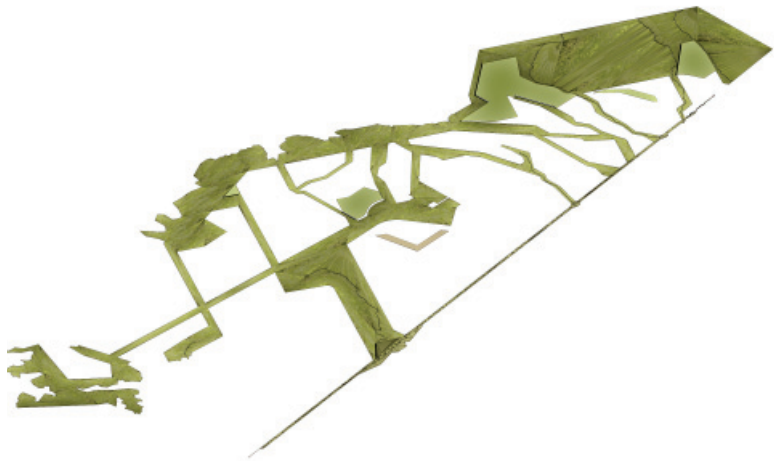
The frame/matrix model described in the previous chapter allows for the development of an urban design concept for the site which accommodates its seemingly incompatible systems and conditions. When mapped on to the site, a figure of some complexity emerges:-- a set of overlapping structural frames, each with unique characteristics and features. Together, these frames comprise a weblike matrix of interstitial fields, which may then be programmed, as suits their position in the matrix, their adjacencies, market conditions, and planning policies.



WALL & STREAM NETWORK



GREEN FRAME & WALL



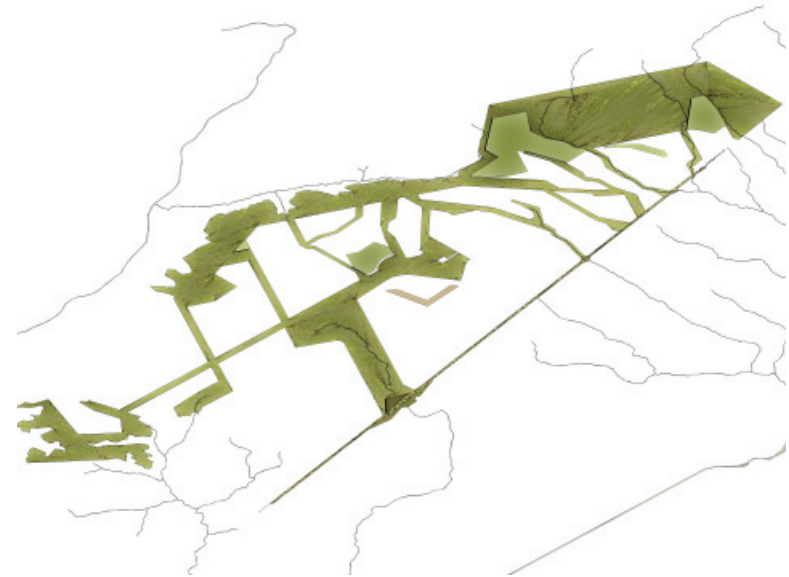
FRAME:GREEN

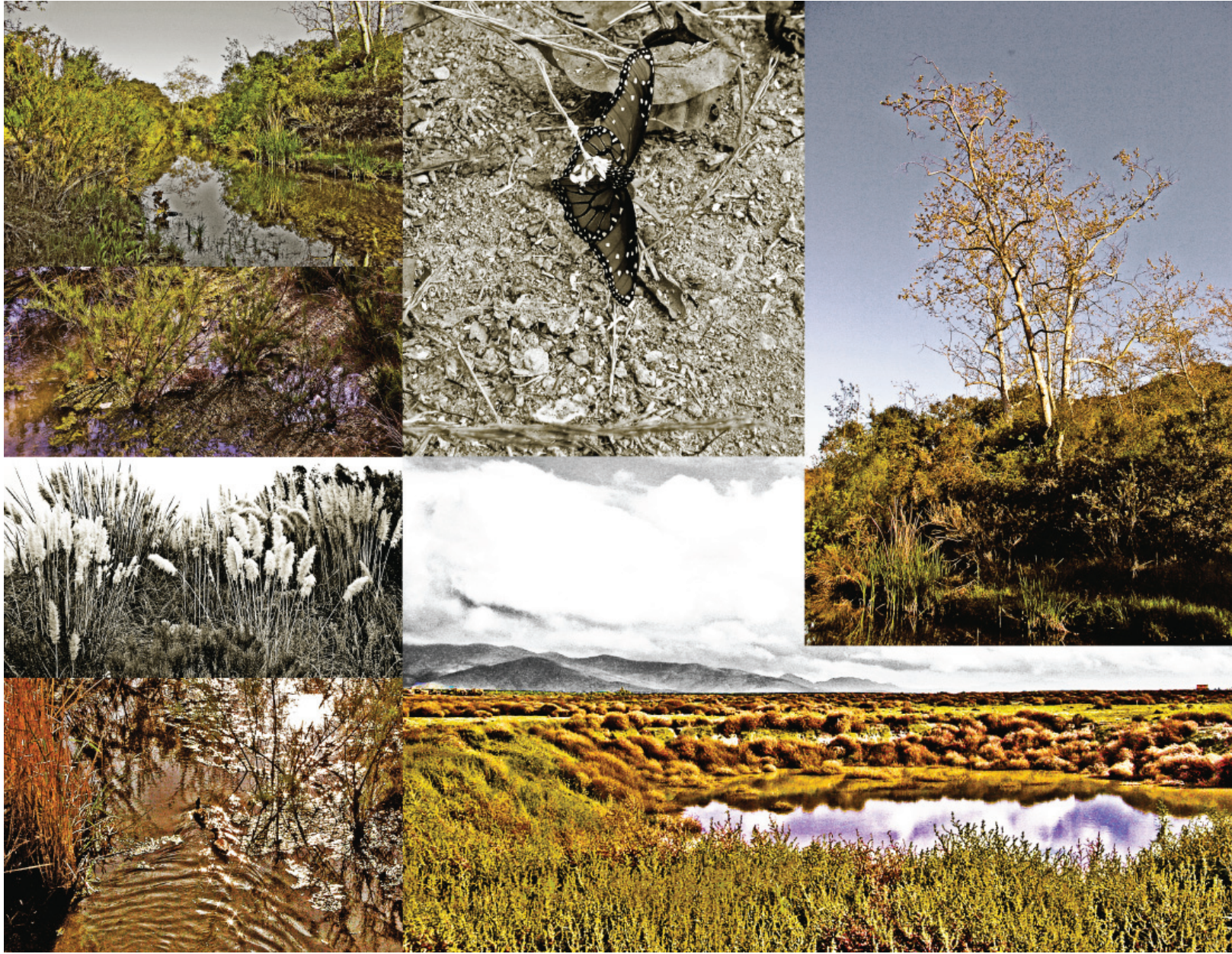
The green frame forms a new skeletal system for the site, based on existing landscape traces. The frame will provide structure, identity, recreation, habitat and water distribution.

The green corridor frame connects the two watersheds, the hills to the east and the canyon system to the west, permitting wildlife to traverse the *mesa*. Vegetation consists of re-inculcated xeric plant communities such as coastal sage brush in south-facing sloped areas, Spanish grass-

es, indigenous wildflowers and various subshrub cultures on the *mesa* terraces, and so forth. Berms and tactical excavations/grading will protect the edges of the system, where necessary. The 11.5 million square meter frame will serve as an effective barrier to the eastward sprawl of San Diego, connecting and reinforcing the MSCP conservation lands that now surround the site like an envelope on three sides. This system of green infrastructure will consist of habitat corridors at least 70 meters wide and generally over 120 meters wide, sufficient to prevent habitat fragmenta-

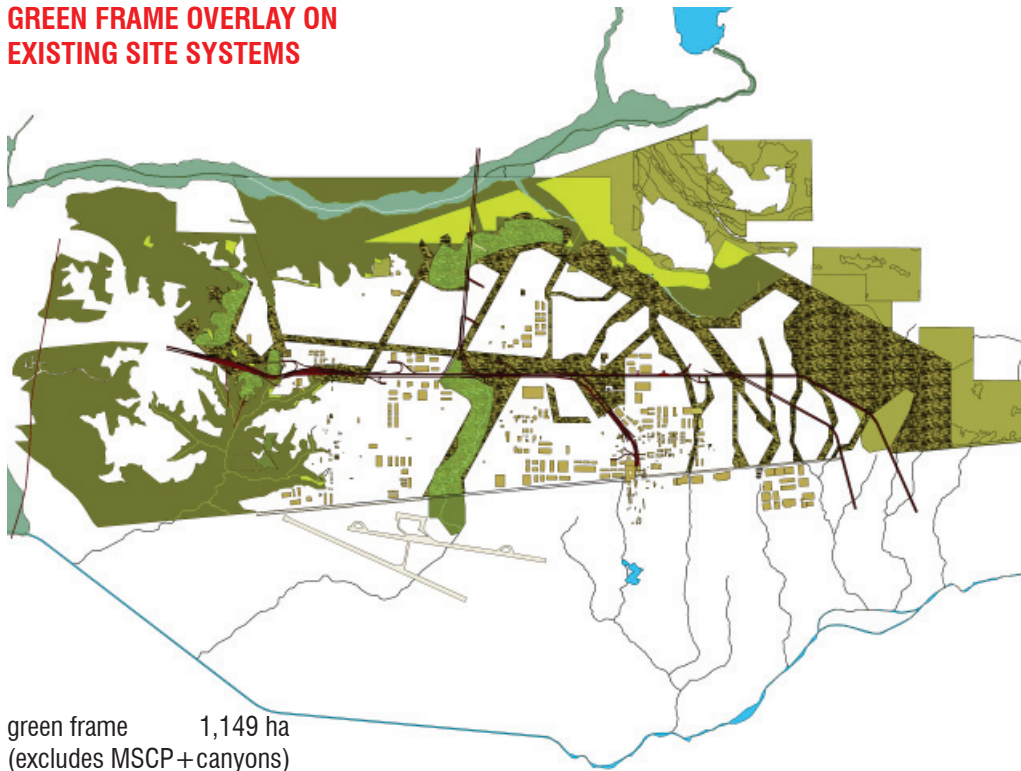
COMBINED





LEFT TOP: typical riparian canyon stream habitat; LEFT UPPER: typical stream organic material when free of eutrophication;
 LEFT LOWER: riparian vegetation; LEFT BOTTOM: ducks in Otay Valley stream; CENTER TOP: pollinator; CENTER BOTTOM:
 vernal pool habitat, eastern plateau; RIGHT UPPER: riparian vegetation

GREEN FRAME OVERLAY ON EXISTING SITE SYSTEMS



tion and perforation. A broad central corridor will cover several critical vernal pool complexes reconnecting them with the eastern, western and northern canyon systems as recommended in Revah (2000).

Seasonal streams flowing through the green corridor frame will receive runoff from throughout the system and from the higher hills to the east. Landscape manipulations will place

surrounding industrial areas effectively below (or bermed against) the green corridors, thereby protecting the system from run-off containing industrial contaminants. The green frame streams and other surficial water will flow, via culverts and piping, under the wall water treatment system described in the next section, perpendicular to the BIS. These surficial flows will reconnect to existing streams that drain into the Alamar

River, on the *mesa's* Mexican side¹.

For ecologically sensitive areas, Forman (1986) recommended the creation of “multi-use semi-natural areas” that respect pattern and ecosystem diversity and preserve ecological integrity against the risk of fragmentation and perforation due to development/habitat loss. These “multi-use” areas would comprise a mosaic of interconnected systems: nutrient retention cycles/systems, soil stability, nitrogen fixation/the nitrogen cycle, ecological integrity, the hydrological system/cycle, natural disturbance regimes and so forth. Large continuously interconnected

¹ The Alamar River is the subject of an unrelated restoration plan, which may be complementary to this vision plan.

GREEN FRAME IN RELATION TO HEAVY INDUSTRY





RESTORED RIPARIAN HABITAT

open space systems like the proposed green frame, he argued, prevent loss of biodiversity and cascading environmental problems.

By following indigenous stream systems, the green frame will also serve the additional function of conducting surface water collected higher in the watershed, principally to the east, back to the two rivers. Continuous urbanization has, to some extent, blocked the return of these flows to the Alamar River, since most urban drainage systems in the area empty to the east, returning directly to the channelized portion of the Tijuana River. Naturally purified highland wa-

ter would thus gain an outlet back to where it is most needed:-- recharging the groundwater deposits in the Alamar Valley, which provide drinking water for thousands of households.

The green frame will also provide specific infrastructural benefits to air quality, by serving as a green lung for areas now isolated behind impervious surface and where vehicle emissions become smoggy local disturbances in the airshed. This is particularly the case in the vicinity of the POEs. The green frame thus facilitates the development of pedestrian-friendly residential communities in areas that otherwise would, due to compro-

mised air quality, be unattractive to prospective residents.

Visually and experientially, the green frame serves another purpose by providing the largely undifferentiated *mesa* terrace with legibility, visual and recreational interest. While livestock will be prohibited from grazing in the green frame, hikers, dirtbikers and equestrians should be able to access most of it via trail systems. Motor vehicles will generally pass over it, on flyovers and small bridges.

D'Hooghe (2006) posited the use of

“territorial figures of infrastructures,” often based on latent traces of precursor systems, to create legibility in otherwise unremarkable urban landscapes. “Programmatic outlines” may then be grafted onto these figures, using a “separate than reconnect” principle. The green frame serves as the site’s most visible figural statement, providing boundary conditions and form to the entire site’s settlement and development pattern, and, through its corridors, separating and then reconnecting, site systems.



RESTORED GRASSLAND HABITAT

FRAME:WALL+

The second proposed infrastructural frame contains a substantially reconstructed BIS, serving five simultaneous roles beyond its base defensive function and its function in this vision plan as an organizing spine for the system of infrastructures that frame the site. In the latter capacity, the wall will serve, as the BIS does today, as the site's primary structural element. The five roles correspond to five segments of the wall, each triggered by its intersection with a particular site condition:-- (i) a site-scale "**Living Wall**" water purification system, running the length of the wall, with entry points from the US side via constructed landscape "swale/resource blocks," defined later; (ii) an "**Exchange Wall**" permeable at various points, and in various ways, for people, vehicles, freight and resources, with the points of permeability triggered by intersection with various access systems and the resource blocks; (iii) a "**Power Wall**" equipped with overhead solar arrays, triggered by adjacency to industrially-oriented neighborhoods; (iv) a "**Green Wall**" where the wall becomes a depression into constructed landscape, triggered by intersection with the green frame; and (v) a "**Peo-**

ple's Wall" where public and cultural spaces are created by the shape of the wall, triggered by adjacency to activated "urban" commercial and residential blocks.

The intention of the vision plan is to transform the BIS from an object most frequently associated with words like fear, danger and oppression, into the "Wall+." a construction with positive significance for Otay Mesa, San Diego and Tijuana, as a regional public amenity.

Basic Form

Wall+ will consist, in its most basic form, of two parallel fences, 5 meters tall (south) and 6 meters tall (north), respectively, running for 9,112 meters east-west along the southern limit of the site. At points, soil berms will rise up to the northern wall. The distance between the two walls will vary depending on the segment and trigger condition, but, for most of the run, the two tiers will be spaced 30 meters apart. In between the two tiers, much of the floor will be depressed an additional meter or two, indicating a total inside wall height of 6 to 7 and 7 to 8 meters, for the south and north, respectively. A parallel service and patrol road will run directly north of the northern tier,

except at POEs, to the east of the eastern passenger/pedestrian POE, and at one broad intersection point with the green frame. For the entire length of the wall, a second, narrower service and patrol road will run in between the two tiers, in a curving pattern.

For discussion purposes, the Wall+ is described as a double wall, as opposed to the triple wall presently under development by the Department of Homeland Security. The concept could, however, be adapted, with some compromise to aesthetics, to a triple wall configuration with the addition of a third fence tier north of the parallel service road; however, this would reduce the visual amenity value of the wall.

Excluding service roads and flanking and supporting systems, the wall will cover roughly 257,000 square meters in surface area. With those systems included, the wall's surface area is roughly twice that figure.

No recommendation is made here concerning materials. The renderings below show parallel reinforced stainless steel bars, arranged like a rebar cage without the concrete, and supported by steel columns. The

bars would be spaced to preclude physical access but may allow visual penetration. The garden in the wall should be visible on either side, wherever possible. For the People's Wall segment, the renderings are shown with plexiglass in the matrix between the bars. Plexiglass or clear plastic sheeting may be added throughout the system, as needed, to reduce wind effects on the area between the tiers (see Living Wall below). For those segments of the system bordered only by heavy industry, transportation infrastructure and the international airport and where there is no visual amenity value, it may be possible to use conventional steel plates or other materials.

Living Wall

The Living Wall is conceived as the basis of the district's water system, allowing runoff and some forms of wastewater to be collected from buildings and impervious surfaces throughout the site and transported downhill via a collector system to one of four pre-treatment areas or the "swale/resource blocks" (sedimentation and settlement ponds, which double as recreational amenities). From these ponds, water will enter organic bioremediation cells in the "wall" proper. There, water



RIGHT UPPER: approach to POE; RIGHT LOWER: aerial view POE showing the wall sump; CENTER UPPER: wall abutted by factories
 left lower: California Department of Transportation, 2005; right center: Vladimix (by-sa) ; right lower: Nathan Gibbs (by-nc-sa)

will be biotopically treated by indigenous wetlands *flora* discussed in the reCONTEXT chapter, as it percolates and winds through kilometers of treatment cells (actually two

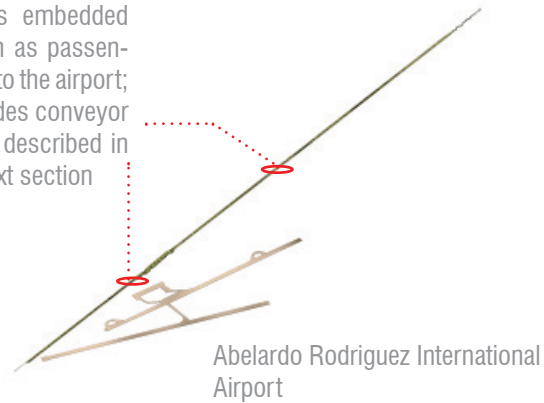
parallel systems, to facilitate maintenance), until it reaches a tertiary treatment and storage tank complex at the western end of the structure. Cleaned water destined for reuse on

the site will then be pumped uphill, using solar-powered pumps, to another storage facility in the northeast corner of the site. From there, the cleaned water will be gravity-distrib-

uted back to industrial and logistics blocks. Separately, treated silt and sludge accumulated in the system will be subjected to further treatment at the western tertiary treatment fa-

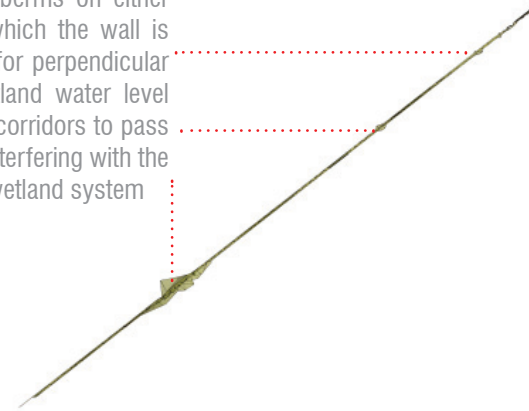
WALL-AIRPORT

proximity of the wall to infrastructural systems triggers embedded terminal facilities such as passenger and freight access to the airport; a second facility provides conveyor access to freight & is described in greater detail in the next section



WALL-CONSTRUCTED LANDSCAPE

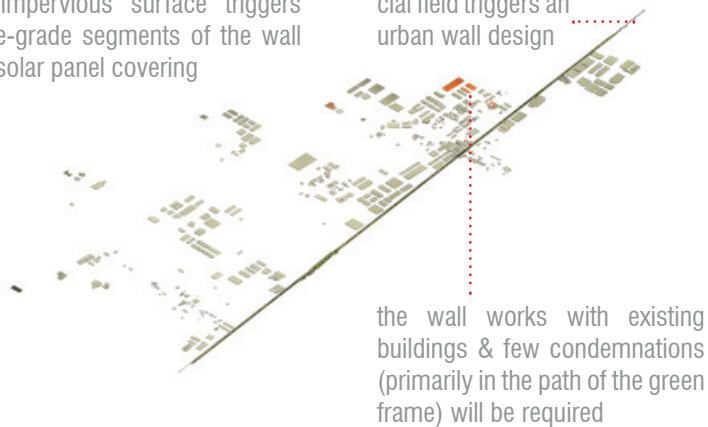
adjacency to the green frame triggers constructed landscape berms on either side of the wall, into which the wall is embedded & providing for perpendicular culverts below the wetland water level for green frame stream corridors to pass under the wall without interfering with the east-west constructed wetland system



WALL-EXISTING BUILDINGS

adjacency to industrial buildings and impervious surface triggers above-grade segments of the wall with solar panel covering

housing/commercial field triggers an urban wall design



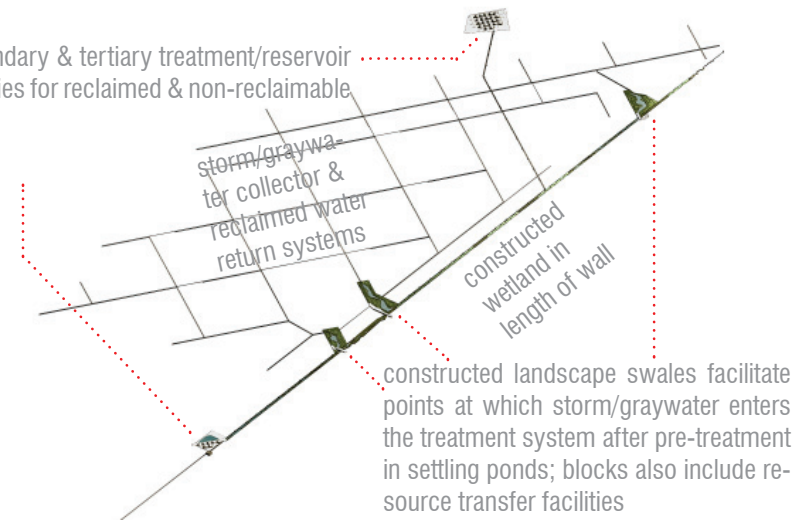
WALL-HYDROLIC SYSTEM

secondary & tertiary treatment/reservoir facilities for reclaimed & non-reclaimable water

storm/graywater collector & reclaimed water return systems

constructed wetland in length of wall

constructed landscape swales facilitate points at which storm/graywater enters the treatment system after pre-treatment in settling ponds; blocks also include resource transfer facilities



cility, and, from there may either be distributed as fertilizer or be transported off-site for disposal.

The constructed wetlands will come to take on the appearance of a lush garden (as has already starting to happen in the accidental sump between the existing wall tiers, as shown in the overhead photograph on the previous spread). The same phenomenon occurs naturally in urban riparian canyon systems throughout the city, since wastewater and runoff from the urbanized terraces inevitably find it way to the canyon floors. The garden-like biotope cells of the wall system will become a visual amenity for communities on both sides of the wall, as well as a green lung and *de facto* bird sanctuary.

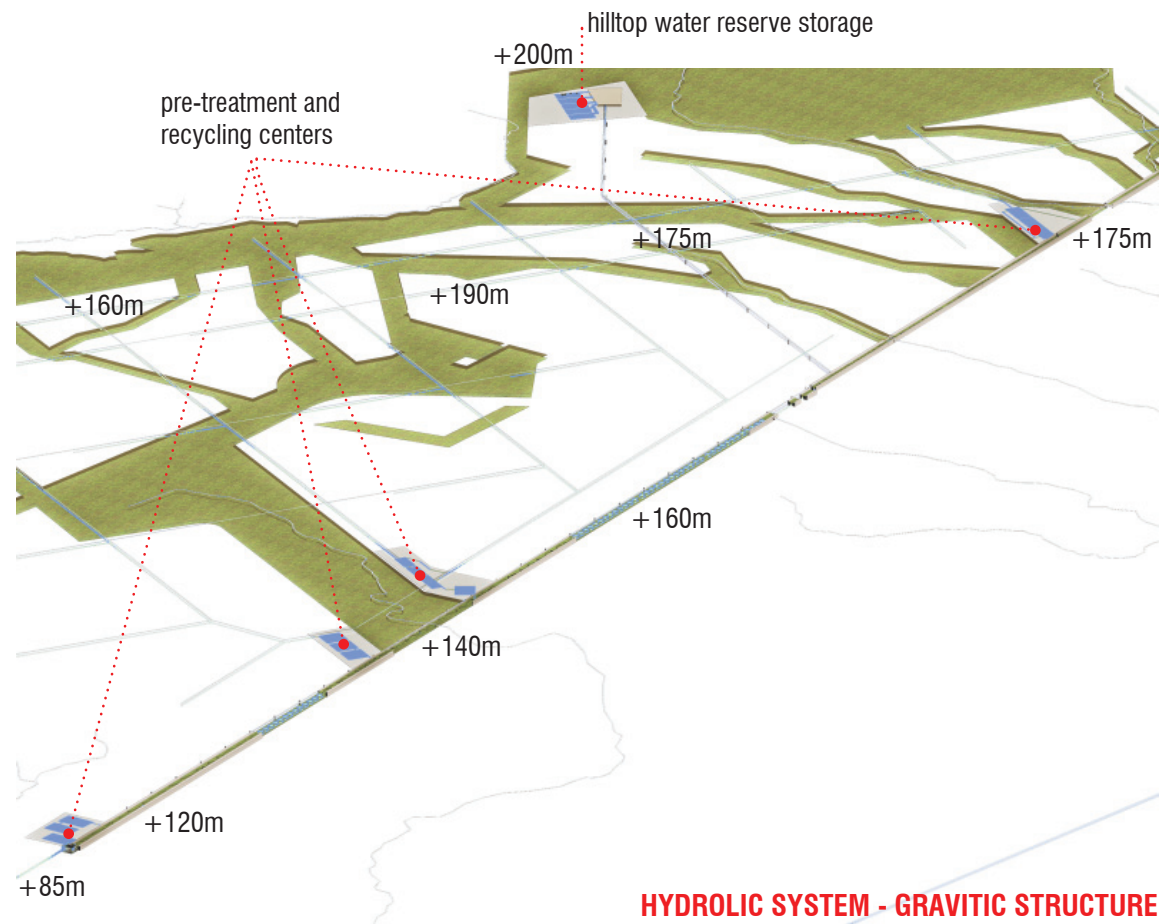
The treatment cells themselves will be depressed one to two meters below the base of the fence tiers, to reduce wind loss and to provide additional shade against evaporation. The internal access road and some edge areas will be one meter below the wall base.

A detailed engineering analysis of the system is beyond the scope of this vision plan; however, a brief analysis of the operating characteristics

of this system is considered in the diagrams in the following pages. In summary, wastewater and runoff will be collected from 1,833 hectares in impervious surface, plus building use. Average rainfall is 255 millimeters, concentrated primarily in the winter months. At buildout, district

households will consume roughly 18 million non-potable liters each day, industrial and commercial users will consume another 4 million liters, and visitors will consume 3 million liters. Based on fixed seasonal capture proportions and evaporation and wind loss for an average 15 days of

pre-treatment detention, the net water use rate of indigenous biotopes, and an average 12 days of system flow time, the Living Wall, which will have a peak load capacity of approximately 9 million liters per day, will be able to reprocess approximately 2.7 billion liters annually (roughly a third



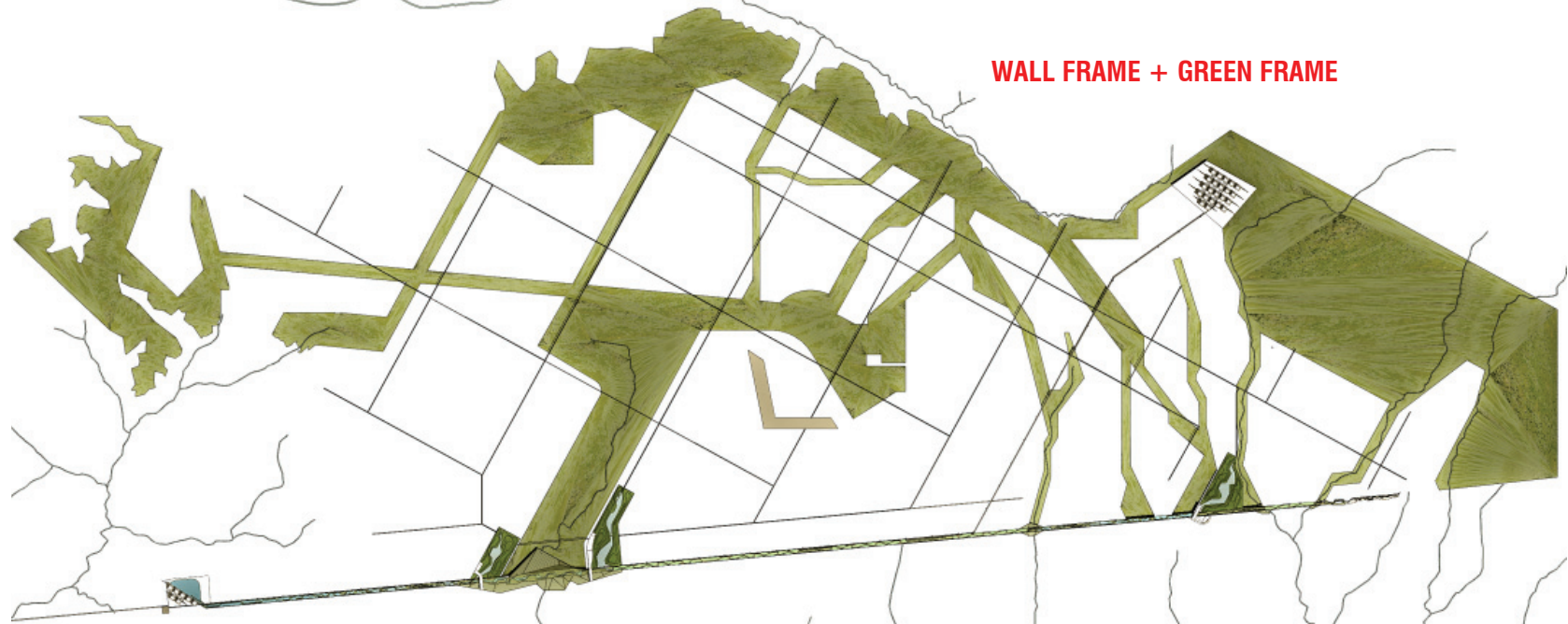
of total annual non-potable site demand, including 100% of industrial, commercial and visitor demand). This being said, during some summer months, when water from traditional sources is at its scarcest, 100% of recoverable waste water released

tant stop-gap role in the city's water resource management regime. In drought conditions and the dry season, the system may be able to ensure that approximately 70% to 85% of non-potable district water demand will become a renewable resource.

level recycling systems.

The Living Wall, depending on cell design and biotope selection, will have the technical capability of treating both blackwater and graywater; however, these calculations show

could be used as the district's sole water treatment facility. This may be achieved by developing a vertically integrated system of treatment cells in the wall or simply by allocating more program space in adjoining blocks to constructed wetlands. An-



into the system from within the district can, in theory, be treated. The lowest system effectiveness will be when it is forced to operate at peak load in December and January, in the rainy season. Fortunately, the stress on traditional waterworks will be at its lowest during this period, allowing the Living Wall to play an impor-

These estimates do not take into account neighborhood-level conservation and recycling measures, which should be undertaken as well. Walker (2004) found that Otay Mesa, with its indigenous water shortage, has been the site of significant experimentation by local businesses and institutions in building and even industrial estate-

size and capacity limitations will restrict it to the processing of largely industrial and residential graywater, from cooling systems, household use, office use, landscaping and so forth. Should the system be increased in size by a factor of two through the construction of additional parallel treatment capacity, it

other alternative would be to import alien (non-indigenous) or engineered biotopes that are known to be more efficient biological processors; however, this may pose risks to the natural habitats in the green frame.

Exchange Wall

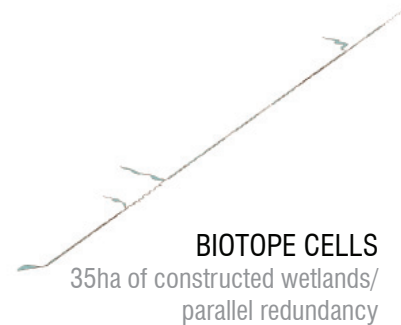
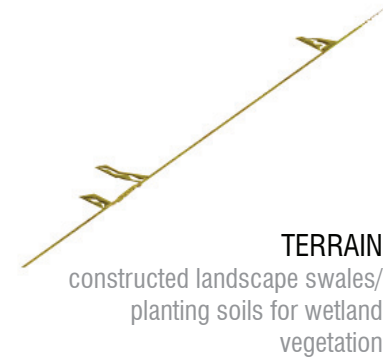
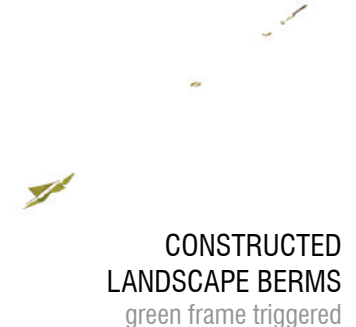
The four "on wall" water treatment ar-

STRUCTURE/SOIL

WETLAND

SUPPORT SYSTEMS

EMBEDDED SYSTEMS



11ha - wall
45ha - supported resource/blocks/
constructed landscape

infra triggered

green triggered

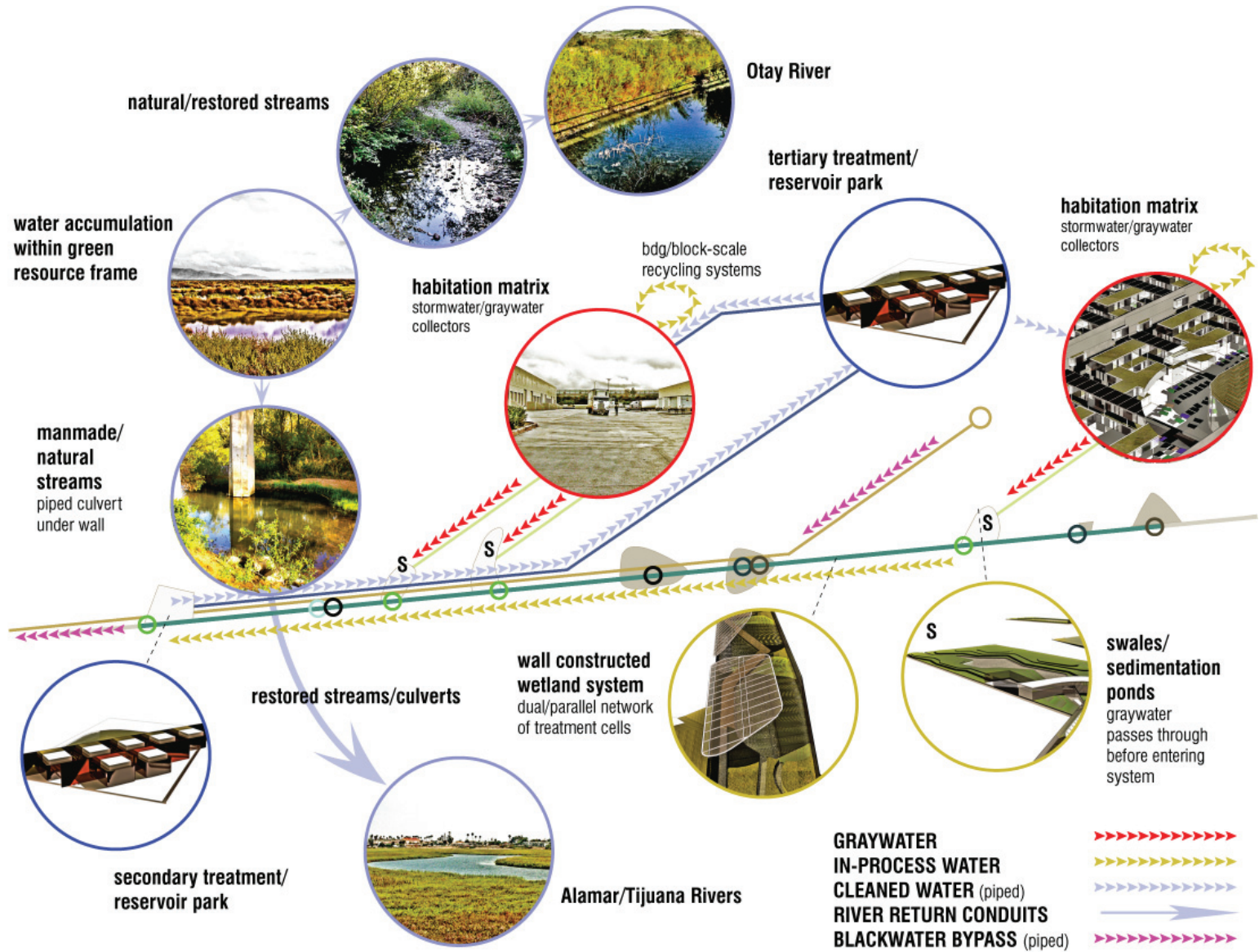
industry triggered

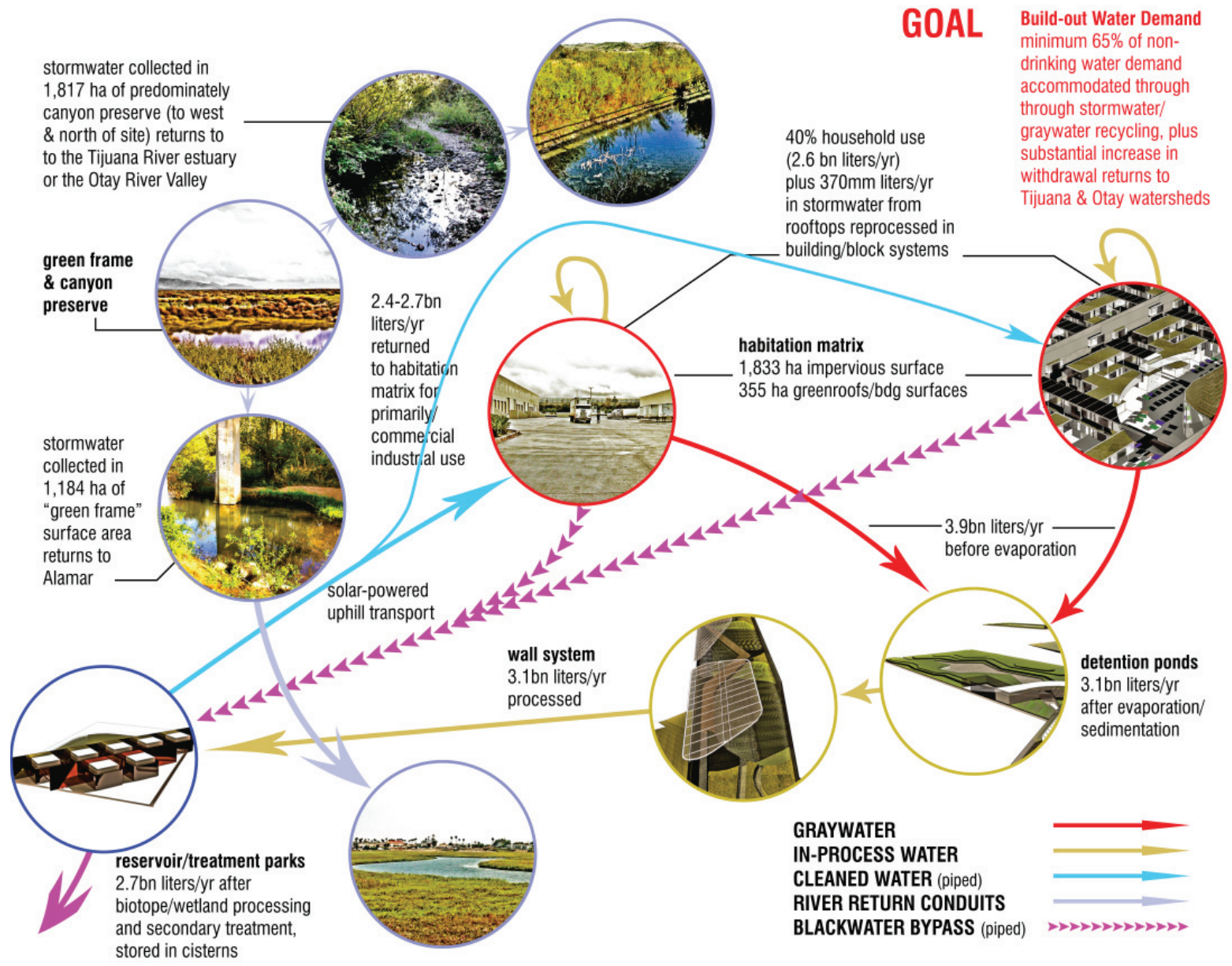
urban triggered



9,112m

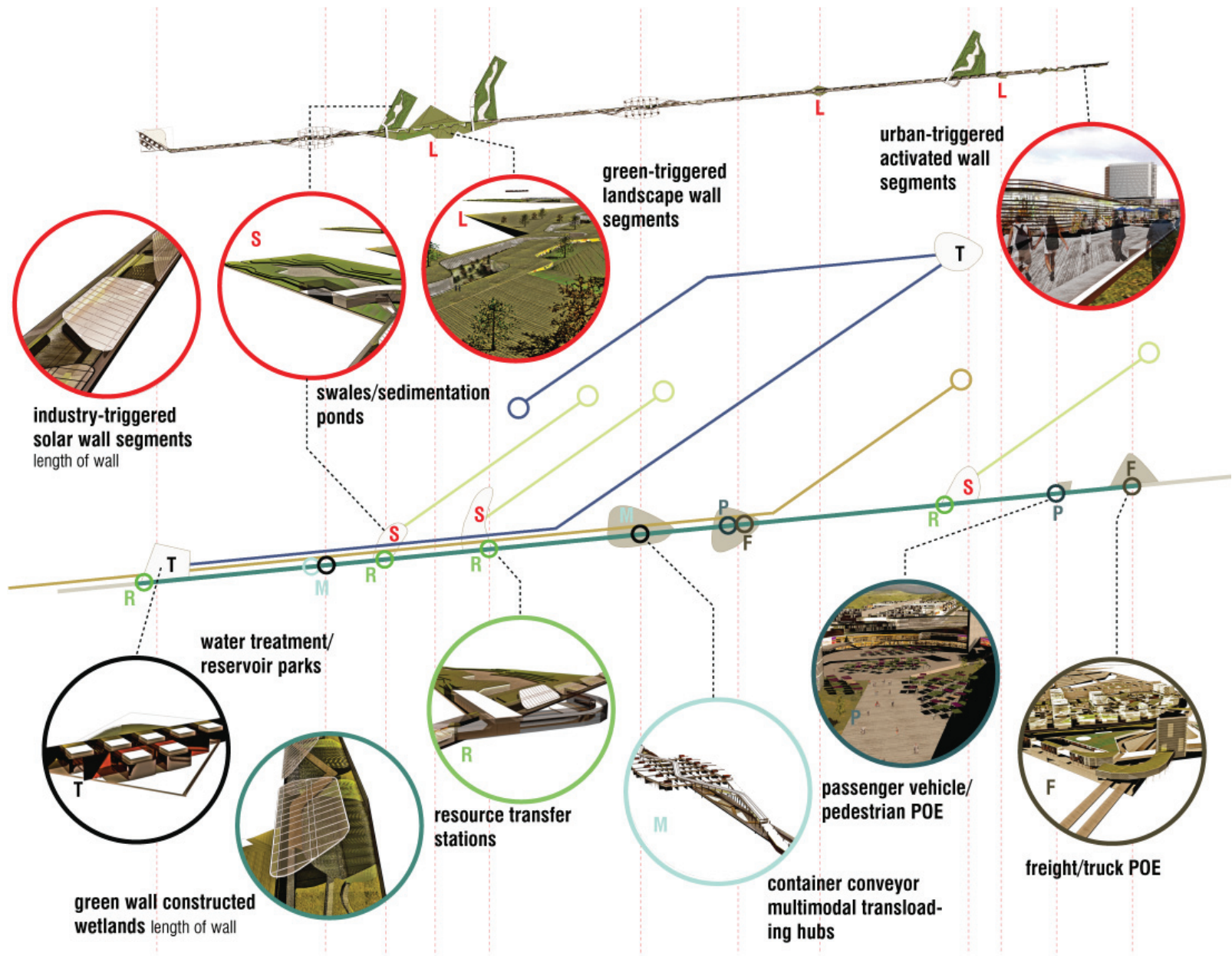
HYDROLOGIC SYSTEM

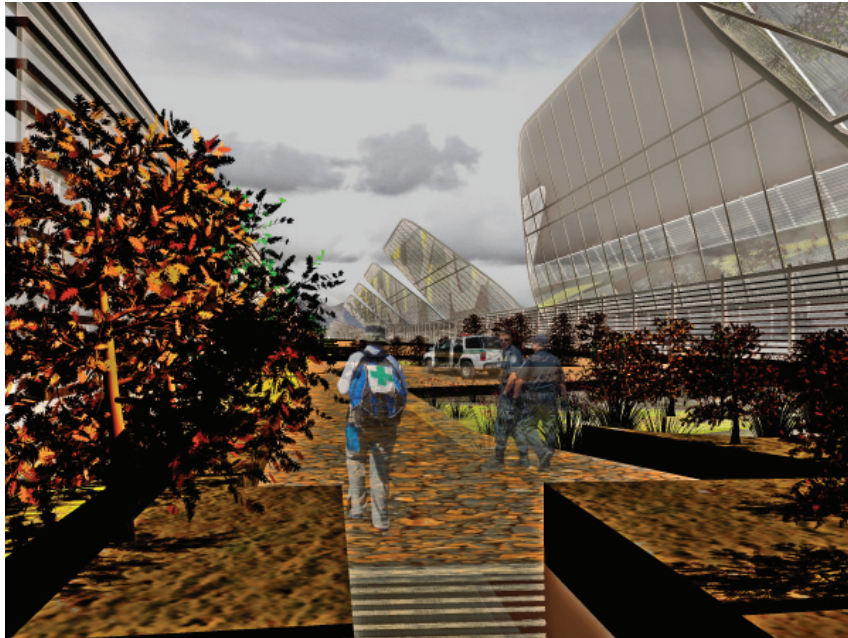




WATER TREATMENT

WALL+ FACILITIES

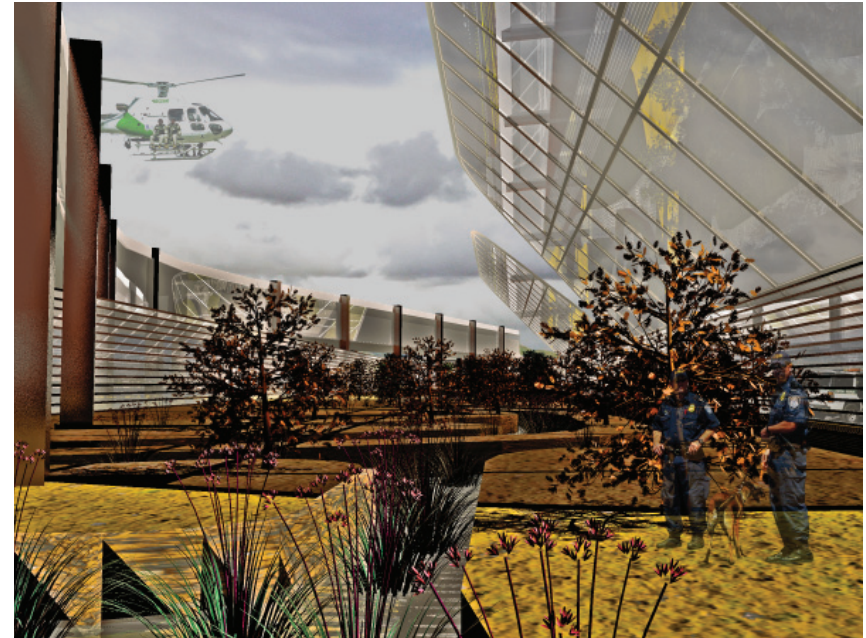




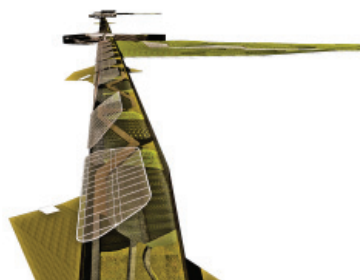
CONSTRUCTED WETLANDS - INDUSTRY TRIGGERED SEGMENTS

areas adjacent to heavy manufacturing/logistics areas will perform a second function:-- freight-tram-and truck accessible resource exchange centers. Manufacturers will be encouraged to

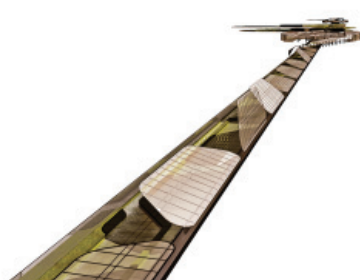
transport surplus materials and industrial by-products to these areas, which can be exchanged for other materials from other processes via elevators and conveyer systems over



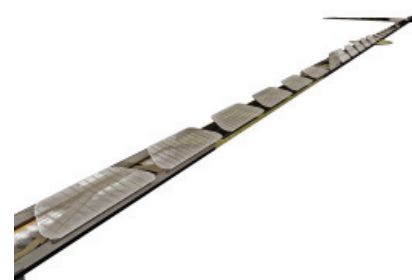
the wall. Much of Tijuana's economy relies on the recycling of San Diego's waste and surplus materials through so-called sham-recycling ventures (Corliss, 2000), and these centers will facilitate and legitimize this process. These same sites will also be used to facilitate eco-industrial exchanges between factories within the site as well. The exchange centers bridge



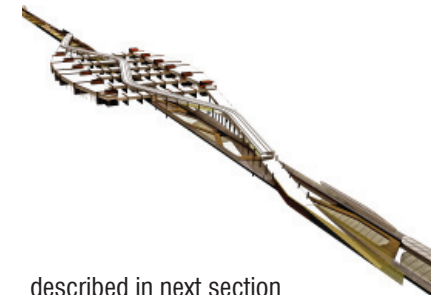
BIOTOPE TREATMENT CELLS



INDUSTRY-TRIGGERED SECTION

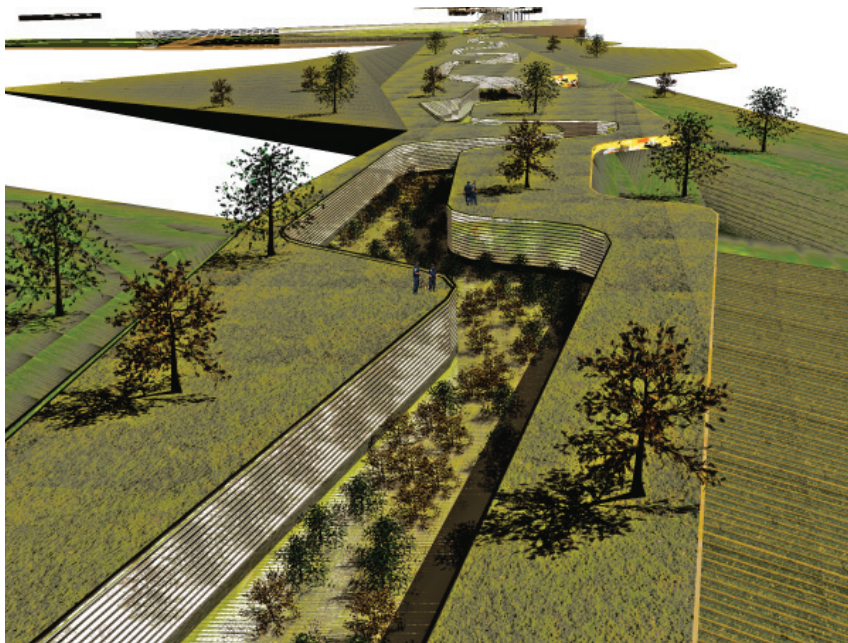


RETRACTING SOLAR CELL ROOFS



described in next section

CONTAINER CONVEYOR ON WALL



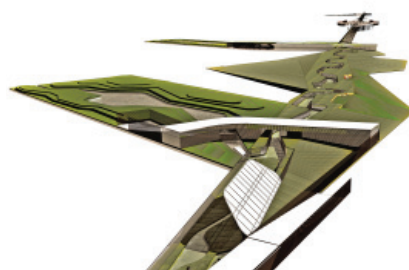
CONSTRUCTED WETLANDS - GREEN TRIGGERED SEGMENTS

the wall, providing limited permeability for the purpose of these resource exchanges, which, in the absence of these facilities, would have to rely on truck transport through the POEs. Other access-related exchange infrastructure embedded in the wall is described in the access frame section.

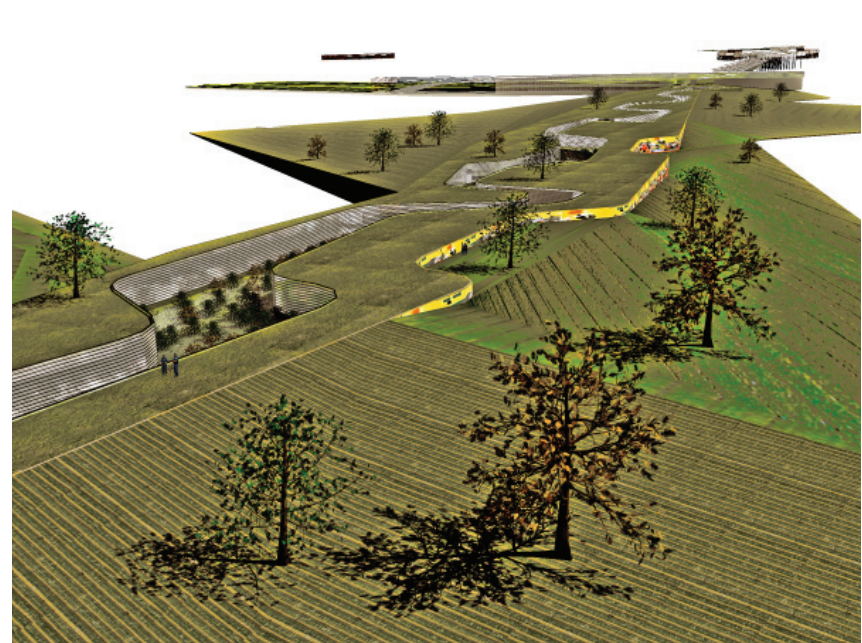
Power Wall

Adjacent to industrial areas, large retractable south-facing solar arrays will be mounted above the wall's constructed wetlands, providing shade and generating power for the pumps, and other BIS-related systems. Ex-

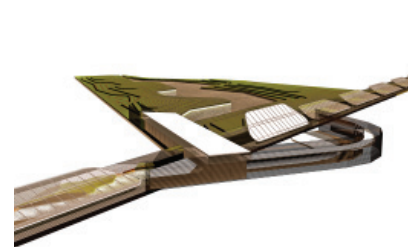
cess power could be injected into the district's grid. At peak output, wall-related solar systems may be able to generate (and presumably store) up to 14 megawatts, in the



SWALE/SETTLING POND



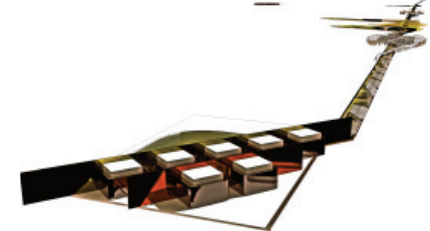
design configuration shown. Solar power is viable throughout the site, and building-based systems should be considered wherever possible.



RESOURCE TRANSFER STATION

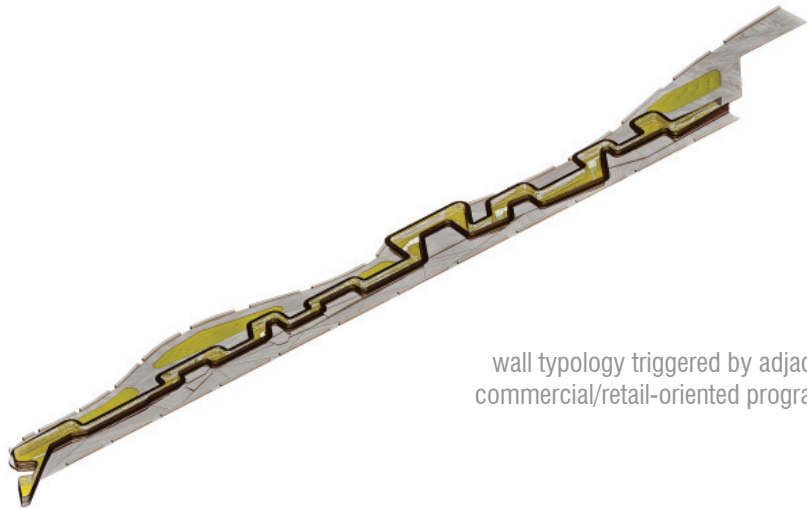
Green Wall

Where the wall intersects the green frame, landscape berms will rise up to the wall, and the wall will, instead, become a ravine, with the wetland



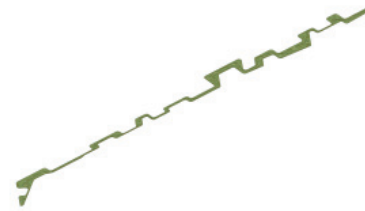
RESERVOIR/TREATMENT FACILITY

CONSTRUCTED WETLANDS -URBAN TRIGGERED SEGMENTS



wall typology triggered by adjacent commercial/retail-oriented programs

PLANTING SOIL



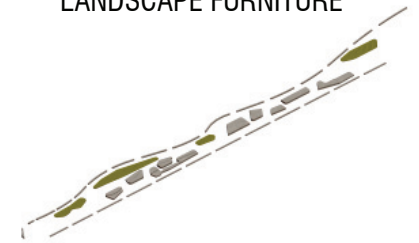
PEDESTRIAN-ORIENTED PLAZAS



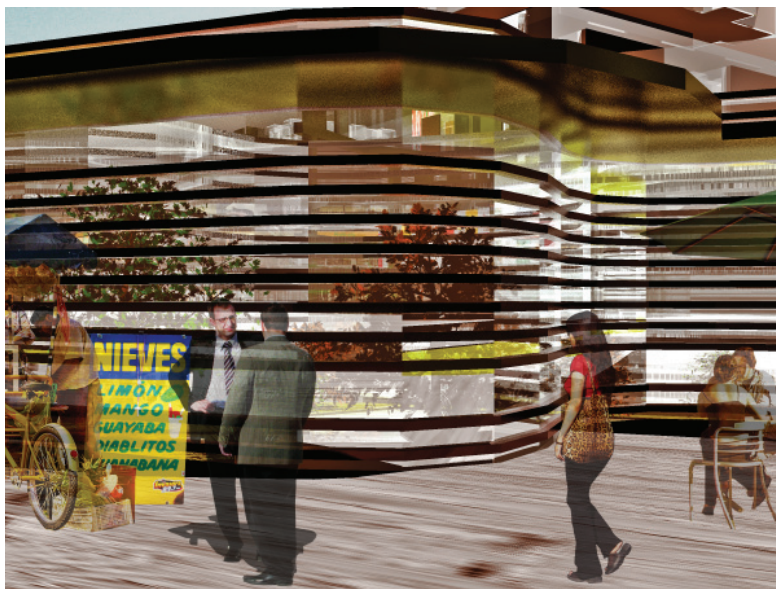
BIOTOPE TREATMENT CELLS



LANDSCAPE FURNITURE



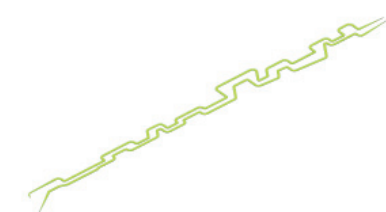
TRANSPARENT GREENHOUSE WALLS



TRANSPARENT WALLS

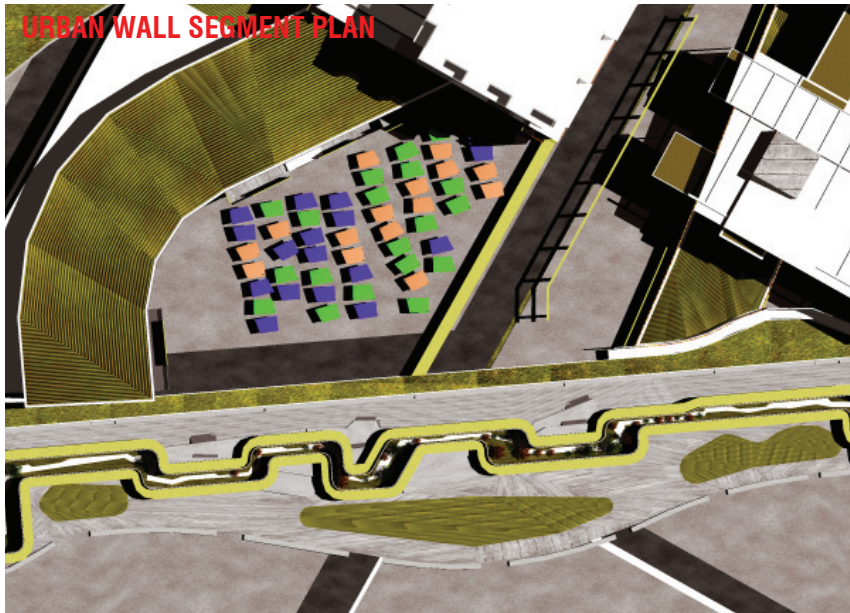


SUN/WATER SHADE CANOPY



cells at its base. If security is a concern, the berms may be increased in height say, to 7 to 10 meters, as shown in the renderings. Green frame streams will pass under the berms and the wall in culverts.

People's Wall
In urban areas, the wall maybe adapted into a greenhouse-type configuration, folding into itself to create public spaces opposite of plazas, *tianguis* and other public spaces.



URBAN WALL SEGMENT PLAN



NORTH OF WALL & PLAZA



NORTH OF WALL PLAZA SPACE



SOUTH OF WALL PLAZA SPACE

FRAME:ACCESS

The urban design intentions and process outlined in the reTRANSFORM chapter require a specially designed system of access infrastructures that facilitate the simultaneous presence on the site of the following elements:

(i) the international **Ports of Entry** and all of the pass-through traffic engendered by the ports -- both by the existing access POE at Otay West and by the proposed POE at Otay East;

(ii) **industrial and logistics** programs capable of supporting a broad array of economic activities and employment, in line with the stated objectives of San Diego planners; and

(iii) the **residential, commercial and recreational** programs required for creation of a vital and sustainable urban community.

These seemingly incompatible uses, when projected onto the site through the transformation process, contribute to the generation of a unique physical environment which will, in turn, host the matrix of highly inter-related urban districts anticipated by the plan.

As previously stated, management of congestion is a primary design intention with respect to the site. Viability of the site as a center for industry, logistics and commerce and attractiveness for residential programming rely upon a high degree of accessibility for container-bearing trucks, smaller city logistics vehicles, buses and passenger cars. Furthermore, vehicle emissions are a primary deterrent to the site's development as a mixed-use activity center, and emissions from idling trucks awaiting customs processing under congested conditions have been identified as a key environmental issue (Kazimi *et al*, 2006). This plan proposes to address congestion through functional separation between the access systems, through new technologies, and through a progressive approach to modal diversification and shift.

The plan is generally consistent with SANDAG's 2007 *Draft Goods Movement Action Plan* in cost and capacity, but may be more conducive to mixed-use urbanization of the *mesa* and to environmental intentions.

Pass-through System

Regional highways serving the site and the POEs are anticipated to be constructed with sufficient capacity

for both truck and passenger vehicle traffic, and thus are proposed here to serve both constituencies. Restricted lanes for passenger vehicles may be considered as a means of improving their usability and managing congestion. Once the proposed network is completed, vehicles and containers entering or leaving the POEs bound for off-*mesa* destinations on either side of the border, such as seaports, will be able to avoid surface streets altogether. The future Otay East truck POE may be reserved exclusively for such through traffic.

SR-905/11 and SR-125 are, as of this writing, under development. They are assumed here to be constructed on their proposed alignments up to the immediate vicinity of the POEs, where the plan particulars require them to deviate somewhat from these provisional alignments².

The plan calls for certain changes to the highway approaches to the two POEs. In the case of Otay West, the southernmost exit ramp on SR-905 will eventually, in the later stages of the vision plan's implementation, be moved northward, to allow the in-2 Renderings of the plan are based on the author's assumptions, given limited public information available on the proposed route alignments.

Inspection facilities to be shifted away from the crowded interface with the wall, to a new Integrated Customs Facility ("ICF") south of the SR-905/SR-125 cross. Along SR-11, the highway will divide into two separate points of permeability along the border wall:-- one, in the east, to a future Otay East truck and freight POE, and a second one for pedestrians and passenger vehicle traffic. This separation will allow development of a dynamic pedestrian-oriented urban hub immediately adjacent to the latter crossing.

Presently, there is no rail service to or through Otay Mesa, and the existing east-west rail right-of-way, the San Diego-Arizona Railway ("SD&AR"), crosses into Mexico directly to the west of the site, reentering the US in the eastern portion of San Diego County. The plan endorses proposals in the 2007 SANDAG freight plan for the construction of a short-line spur off the Burlington Northern-Santa Fe ("BNSF") line in South Bay, to the *mesa*, where a container transloading facility may be constructed. The short-line will proceed south through the Otay West POE and reconnect to a re-aligned SD&AR in Mexico. Once truck inspection facilities are relocated to the ICF, the existing megastruc-

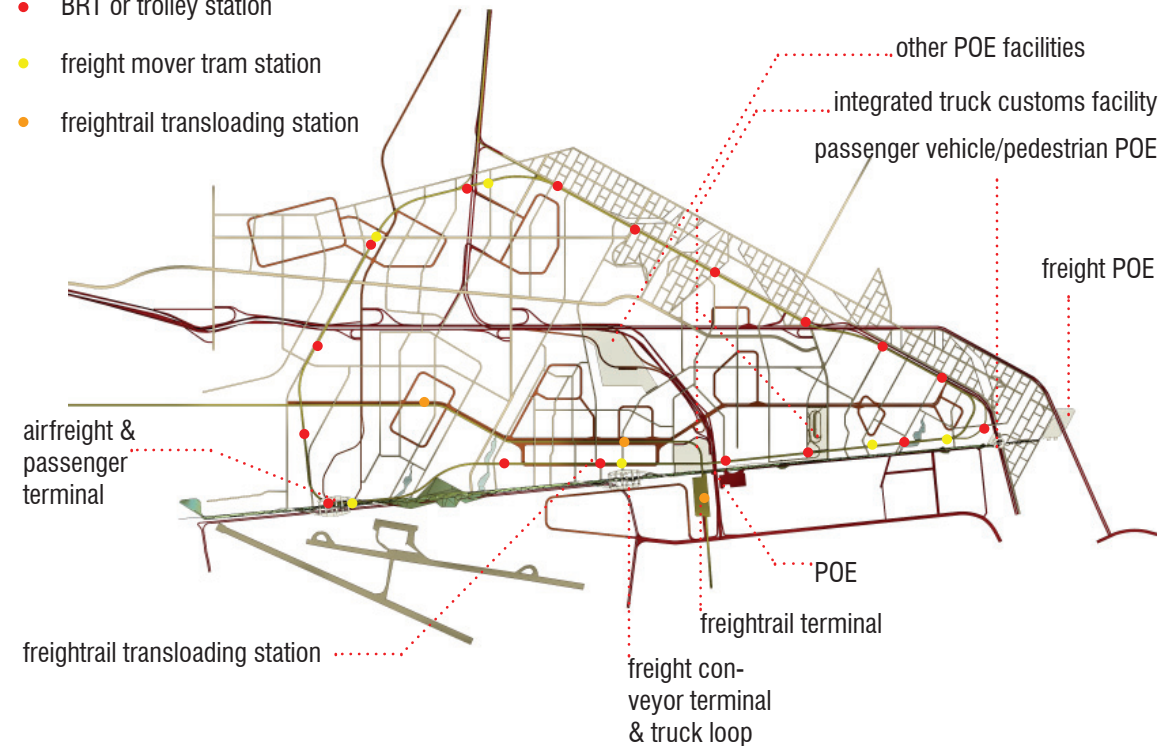
tures at the POE, including a large linear truck depot on the Mexican side, can be recycled into an intermodal transloading facility.

Separate Truck & Passenger Local Access Grids

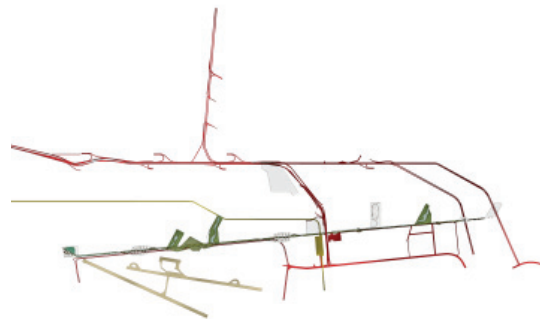
Passenger vehicles will exit to a surface street grid while most trucks will use a separate logistics grid, organized into loops through areas within the matrix framed by the infrastructural net and dedicated to heavy industry and logistics. Overpasses, underpasses and berms will allow the two systems to intertwine in such a way so as to permit commercial and residential programming to coexist with greater proximity to logistics and non-polluting industrial programs than would otherwise be possible. Trucks and freight-moving

ACCESS INFRASTRUCTURAL SYSTEMS

- BRT or trolley station
- freight mover tram station
- freight rail transloading station



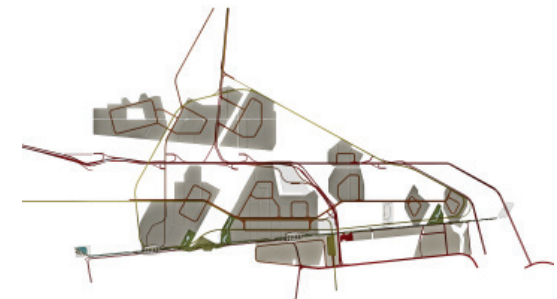
HIGH CAPACITY ACCESS SYSTEMS



ALL LOCAL ACCESS SYSTEMS

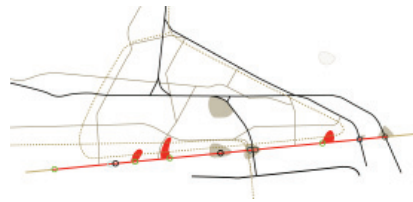


FREIGHT ACCESS SYSTEMS



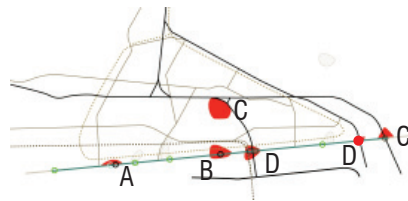
WALL INFRASTRUCTURE

the various “wall frame” systems comprise a set of integrated infrastructures, explicated at some depth in the previous section



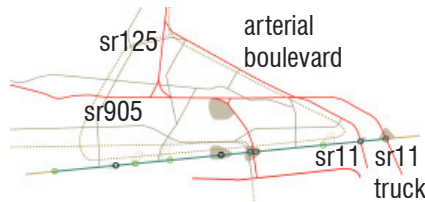
POE/CUSTOMS FACILITIES

72ha in US, including (A) airport multimodal freight/passenger terminal, (B) container conveyor system, (C) integrated freight customs facilities, (D) car/bus/pedestrian POEs, all linked to trolley/tram systems



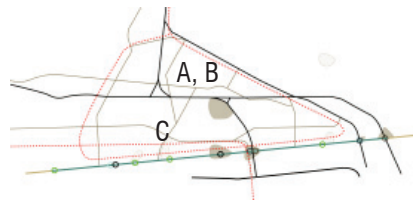
ACCESS HIGHWAY SYSTEM

SR-125 and SR-905 remain largely on their planned/announced alignments, the SR-11 extension divides into two segments - one for trucks and one for vehicles, heading to the east POE



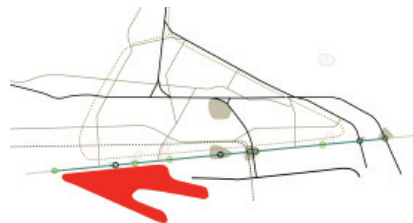
RAIL/TROLLEY SYSTEMS

shared loop alignment: (A) MTS red trolley or BRT serves residences/employment, (B) Dresden-style freight tram serves industrial/logistics sites; (C) separately, proposed BNSF freight rail alignment into Mexico/transloading facilities



INTERNATIONAL AIRPORT

Brown Field is phased-out and Abelardo Rodriguez International is expanded, with a cross-border freight/passenger terminal embedded into the wall; interconnecting with freight rail, tram/trolley



equipment could be kept almost entirely separate from pedestrian-oriented streets.

Surface Grid & Mass Transit

The surface street grids will connect with the highway grid but will be separated from the logistics grid with only necessary service roads linking the two systems. The surface street grid will provide access to residential, commercial/retail, recreational, transit/train stations, parking structures and industrial/employment areas for passenger vehicles. A loop from the surface grid will connect to the proposed airport terminal. Extensive structured parking facilities will be provided at the POEs and near mass transit stations. The surface street grid will be designed to be pedestrian and bicycle friendly.

BRT or trolley loop alignment will circle the periphery of the site and connect to the proposed South Bay inland BRT/trolley line. This system will be grade-separated along a fixed and mostly elevated loop, similar in the design to the MTS Green Line presently serving neighborhoods along the San Diego River. This loop will connect with the proposed BRT/trolley alignment in Otay Ranch, to the north, over the Otay Valley, ei-

ther via the SR-125 bridge presently under construction or a new parallel bridge. The BRT/trolley will be designed to permit high volume commuter access to the west POE and the proposed urban node adjacent to it, on either side of the wall.

Logistics Grid

The logistics grid will comprise an irregular network of up to eight roadway loops, grade-separated from the surface street grid. Loops will exit from these broad roadways permitting access to eight industrial fields described subsequently. Where needed, landscape medians, sound walls and planted surfaces will buffer the logistics grid. The logistics grid will interconnect with all other freight handling infrastructures to permit intermodal transloading. Transloading yards and container elevator/conveyor support will be provided at key points, such as the proposed airport freight terminal, the proposed freight short line rail link, the Otay West POE and two unique systems detailed below: the container conveyor system and the freight tram.

Container Conveyor System

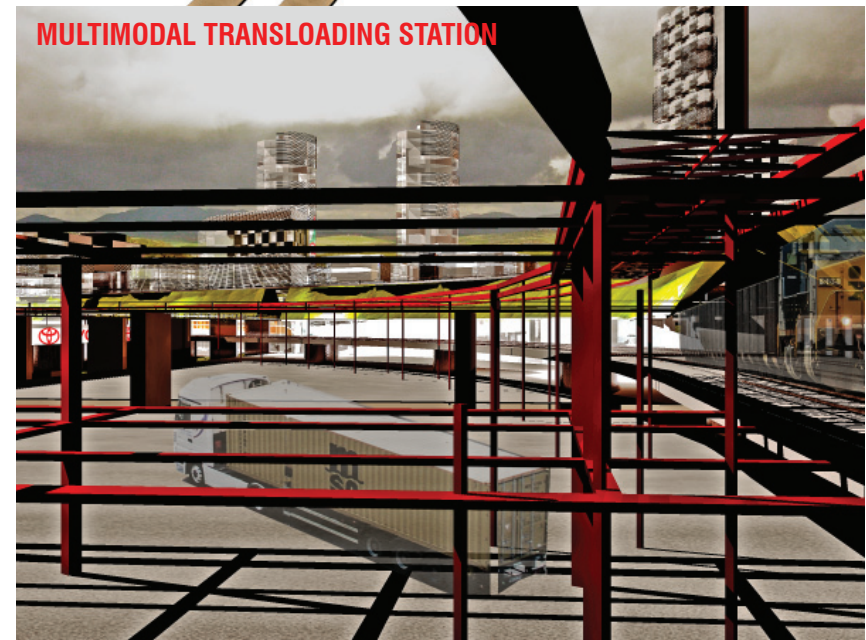
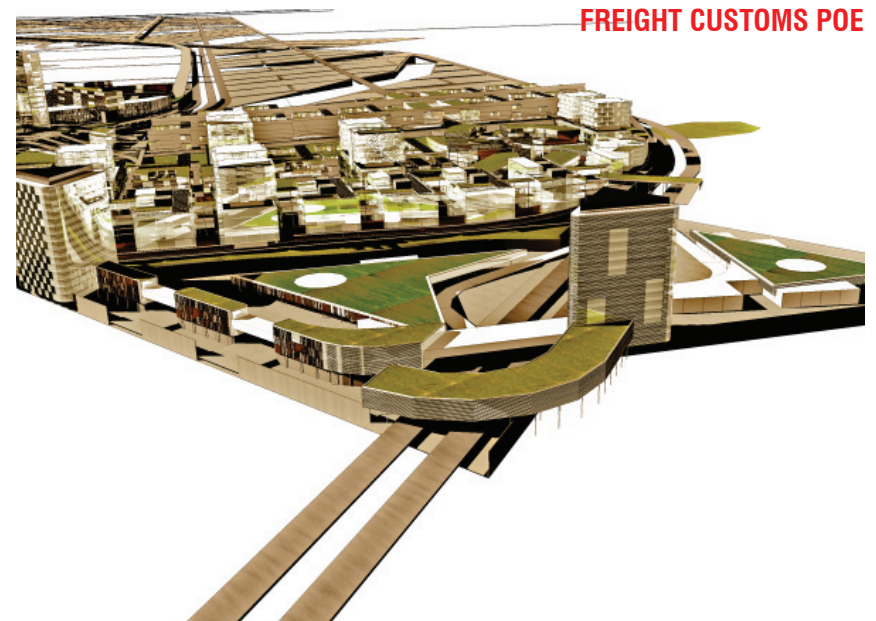
A significant number of trucks cross into the US only to transload goods and then return empty, after complet-

ing their circuit through the *mesa*. This circuit can take up to six hours, given the required customs clearances. This plan recommends creation of an innovative conveyor system which will allow trucks from Mexico to enter a loop adjacent to the airport on the Mexican side and then offload their sealed, pre-cleared containers and cartons. These containers will be placed on heavy-duty conveyors and shipped through the wall, to waiting trucks, trams and trains on the other side or reciprocally.

Freight Tram

To further reduce truck trips within the site and to facilitate necessary modal shifts, a hydrogen-powered freight tram³ sharing the BRT/trolley alignment, will move cartons and

3 Freight trams have been used for goods and components movement between technology-driven manufacturing sites in other cities; the Dresden CarGo tram is a case in point (*e.g.*, Nemoto *et al*, 2005); this case differs from these examples only in that an additional intermodal transfer is required for goods moving between production sites on different sides of the border wall.



containers between the eight industrial fields, the airport, freight rail and conveyor terminals and adjacent areas. Since much goods movement within the *mesa* occurs using the same large vehicles used for the cross-border circuits proposed here to be replaced by the container conveyor system, an alternative intra-*mesa* goods movement will be required, which the freight tram will provide.

Based on preliminary and informal analysis of data of truck traffic using publicly available data (from Kazimi *et al*, 2006; California Department of Transportation District 11, 2006; Parsons Transportation Group *et al*, 2000; Science Applications International Corporation, 2003), these systems may, in aggregate, allow up to a fifty-five or sixty percent reduction in total one-way cross-border truck trips and will greatly reduce the emissions output of the remaining trips through congestion reduction and the proposed modal-shift.

Integrated Customs Facility

The design of POE freight-handling facilities should give recognition to the differences in the types of cross-border flows and destinations. A limited number of large manufac-

turers and customs brokers handle the vast majority of containers and trucks which cross the border (SAIC, 2003; Parsons, 2000), permitting much of the traffic to be electronically pre-cleared and sealed in containers using RFID tagging. Furthermore, containers heading to seaports and other destinations beyond the US and Mexican *mesas* need to be processed and handled differently than site-to-site movement of components, resources and production factors. Given these differences, there should be no logistical requirement for the preponderance of customs clearing to occur through duplicate facilities taking up valuable space at the physical bottleneck of the wall.

For locally bound shipments not able to be pre-cleared using the RFID method, for example, US and Mexican customs operations could be conducted at a site constructed on less valuable land located up to several kilometers north of the current site, so long as SR-905 may be kept relatively closed to local traffic between the border and such a facility. Such an ICF would greatly reduce congestion at the Otay West POE itself. Through-container traffic may be diverted to Otay East or handled at separate queues at the ICF.

The entire site would thus become a tiered freight-processing system -- effectively an integrated expedited-clearance customs zone as well as a production area.

Effects & Impacts

The proposed access infrastructures not only establish a framework for innovative urban form-making but also facilitate the further development of green or sustainable supply chains for technology-driven industry on Otay Mesa.

Many local manufacturers favor the use of coordinated production processes and distribution chains involving multiple sites on both sides of the border wall. Facilitation of such cross-border supply chains through the development of trade infrastructure will also facilitate growth in the *maquiladoras* industry in particular and technology-driven manufacturing as a whole, in general. The relationship between the economic sustainability and continued viability of these increasingly sophisticated industries in San Diego/Tijuana and trade infrastructure has been extensively documented (*e.g.*, Ganster, 2006; Herzog, 2003; Gerber, Carillo, 2002; Erie, Nathan, 2000; others).

MATRIX FIELDS

The three frames provide a structural system akin to a skeleton, which will facilitate the arrangement of a matrix of fields. As discussed in the reTRANSFORM chapter, the placement of a field in the overall matrix and its adjacencies to frame-based infrastructural, green and wall systems, determine the programmatic mix possibilities of the field.

Matrix fields are broadly classified as follows: Alive, Indflex (short for industrial flex), MLOG (short for manufacturing & logistics) and border (customs and security activities). These classifications may be further broken down into subcategories, such as housing and academic, although it should be noted that these terms refer to tendencies as opposed to zoning classifications. Fields of a given subcategory may host diverse mixtures of built programs.

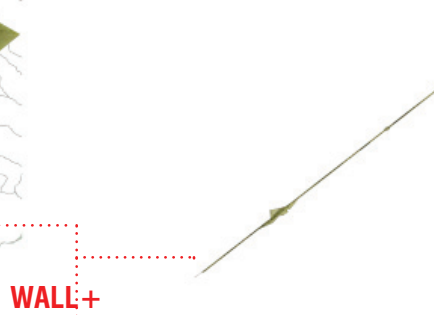
In addition, there are a number of non-matrix fields that correspond to frame elements:-- conservation (much of the green frame) and resource management.

Berms, tactical excavations and other landscape and slope manipulations

GREEN FRAME



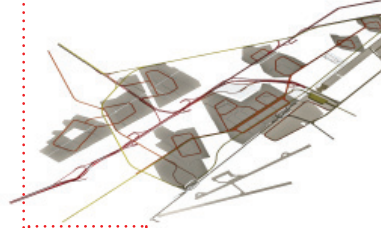
WALL FRAME



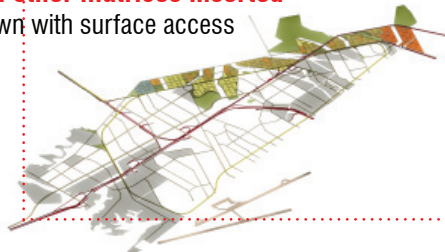
WALL+



with MLOG matrix inserted shown with freight access



with other matrices inserted shown with surface access



POE. The name Alive is based on a substantial town called Siempre Viva, which, in the late 19th century, was located in the now largely undeveloped area between the existing and proposed POEs.

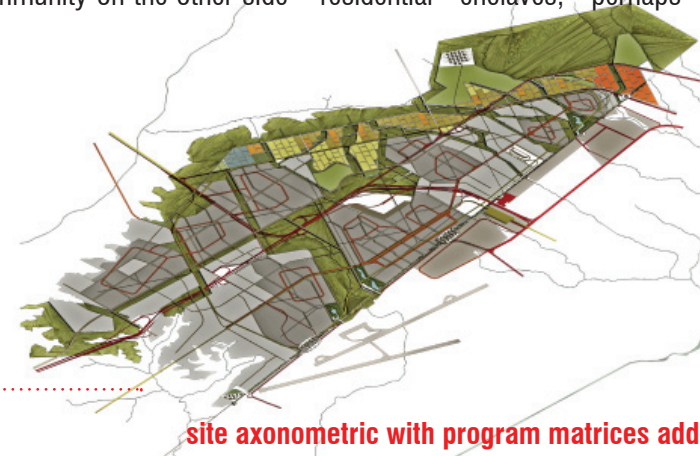
Alive will comprise Otay Mesa's mixed-use residential and commercial district. Alive fields are classified into the following subcategories:--core, medium-high density housing, medium-low density housing, academic and border-hospitality and recreation, with the core and border-hospitality intended to comprise something of a central business district for border and industry-related trade, management and services. This subarea is also referred to as the "Trade City." The American Trade City is intended to be mirrored by a similar community on the other side

of the border.

Alive blocks face southwest, enabling maximal benefit from San Diego's prevailing seasonal wind directions and solar gain characteristics. The fields slope upward toward the eastern hills, allowing potential development sites to have views of the *mesa*, the Tijuana skyline, and the sea.

Indflex

Industrial flex fields comprise a dozen distinct neighborhoods arrayed across the site. These fields are primarily redevelopment areas, presently comprising light industrial and warehousing programs. However, it is proposed that they be re-designed to be densified and to facilitate the development of well-designed commercial and, in limited instances, residential enclaves, perhaps in



site axonometric with program matrices added

are used to shape the edges of fields should adjacencies or the nature of activities within the field in question require buffering. In general, fields containing a preponderance of emissions-generating, waste-water-generating or other noxious activities are, through tactical excavations, berms and other treatments, lowered in elevation in relation to immediate neighbors, ensuring some degree of sound/odor insulation. The direction of contaminated greywater and runoff can also be managed so that it drains exclusively into the wall water reclamation system's collectors.

Alive

Alive fields are arranged on the gentle hillside along the eastern and north-eastern extent of the site, on a diagonal along Johnson Canyon and as far as Boulevard de las Torres, including the location of the planned Otay East

ALL MATRIX FIELDS

1,717 hectares (1,709 in US) of gross developable space, excluding the infrastructure, green and wall frames, and any Homeland Security or other customs-related programs

ALIVE

198ha of gross residential space (varied medium densities), including 12ha for schools, social services and local retail. In addition, 97ha of community park space and 17ha for a future college/technical institute

ALIVE TRADE CITY (CORE)

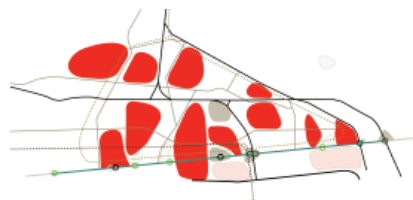
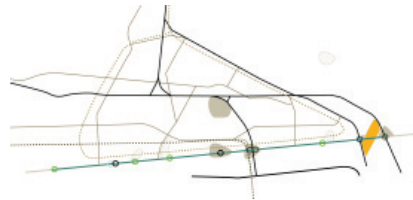
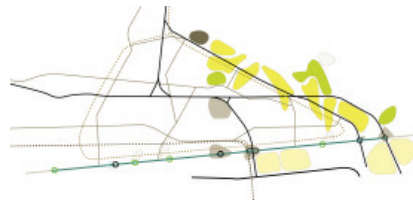
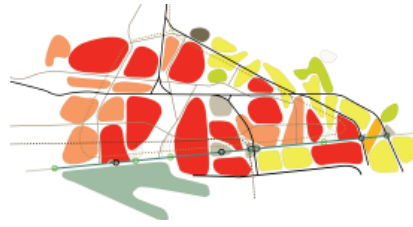
14ha of gross mixed-use space in US plus 8ha in Mexico (after streets), structured to accommodate vertical mixed-use commercial-office, regional retail/hospitality and medium-high density housing

INDFLEX

599ha of gross light industrial space (after streets), 76ha of which may someday become warehouse conversions into big box retail or specialty multi-unit housing

MLOG

791ha of medium to heavy manufacturing and logistics space (after streets), including existing and redeveloped tracts



converted warehouses. Commercial offices tied to manufacturing and possibly future research and development activities may also be encouraged. Finally, most big-box retail stores on the *mesa* would be expected to locate in Indflex fields.

Indflex fields provide for a high degree of flexibility with respect to the *mesa*'s future development, allowing real estate market conditions to determine the end programmatic mix to a greater extent than would be possible with conventional zoning. Policies may thus be designed to protect industry, but the city would not find itself with a surfeit of industrial land. Instead, the "flex" real estate could be easily reconfigured into other programs should market conditions change⁴. These fields are also intended to be sites for architectural innovation: building typologies will be expected to flex between different programs without demolition.

MLOG

Manufacturing and logistics fields are intended to attract programs which require 24/7 heavy truck and/or rail









⁴ The Indflex concept is intended to respond to concerns expressed by the local real estate industry about the City of San Diego's policy of protecting industrial land (see London Group, 2006).

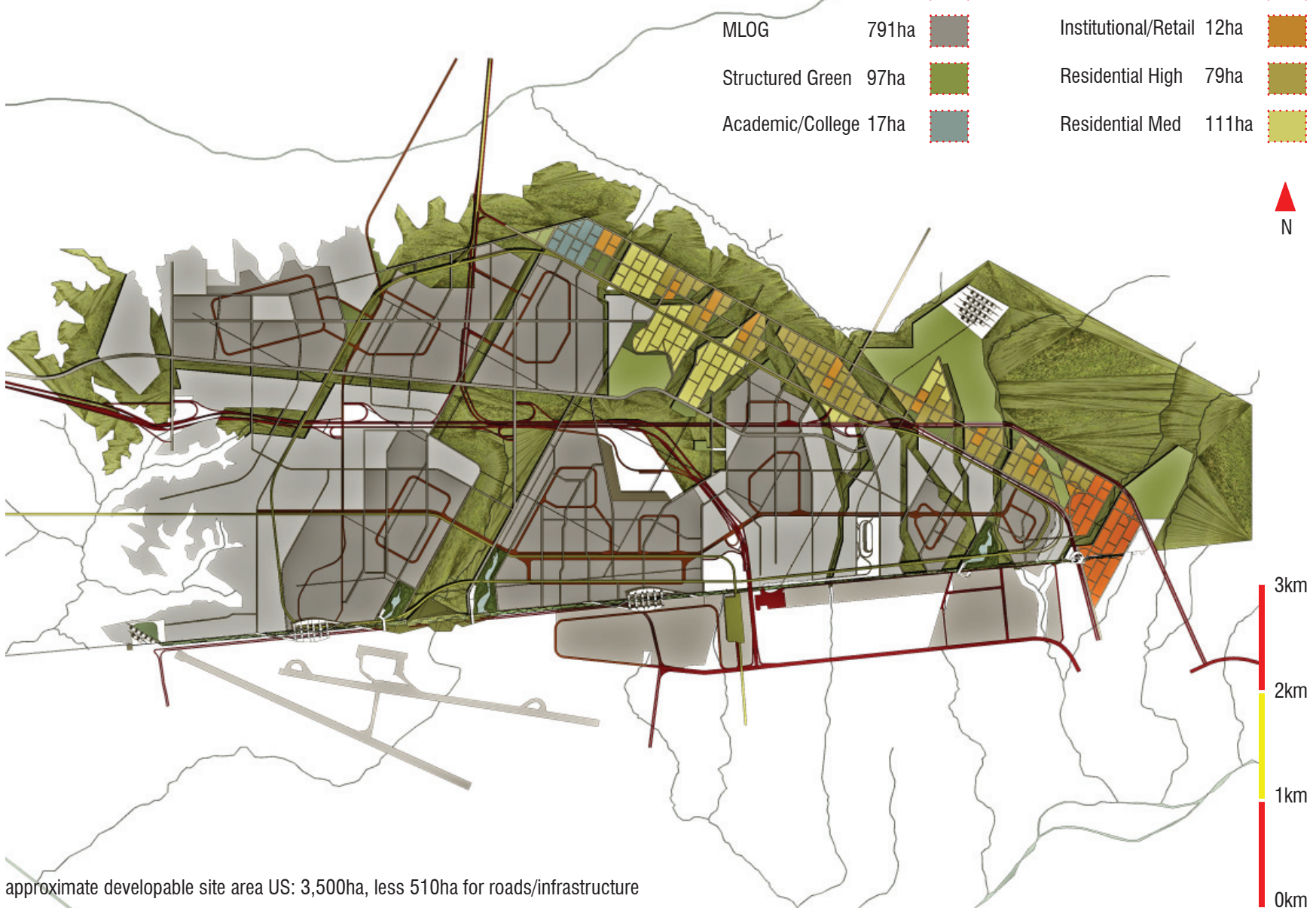
access and container processing, and they will have the highest degree of proximity to the infrastructural logistics grid discussed earlier in this chapter. The proposed freight tram, transloading facilities and container terminals will either be within or directly adjacent to MLOG fields.

MLOG fields will consist largely of factory and logistics developments, perhaps using state-of-the-art collectively-managed freight-village development and supply-chain models (e.g., Ho, Karunakaran, 2005; UNESCAP, 2005; Weisbrod, 2005). Commercial offices typically tied to manufacturing may be located in adjacent Indflex fields, possibly in a manner that involves physical connection to MLOG sites.

A typical MLOG field will be designed as an "eco-industrial park" (e.g., Graedel, 2005); with a full range of field-level environmental and resource exchange systems, which facilitate the recycling of production by-products and other waste as well as wastewater reclamation. Water pre-treatment and power cogeneration may also occur within an MLOG field.

MASTER FIELD PLAN

US ONLY:	Indflex	599ha		Trade City (CORE)	14ha	
	MLOG	791ha		Institutional/Retail	12ha	
	Structured Green	97ha		Residential High	79ha	
	Academic/College	17ha		Residential Med	111ha	



approximate developable site area US: 3,500ha, less 510ha for roads/infrastructure



rePROGRAM

program scheme

programming

phasing

comparison

PROGRAM SCHEME

The plan projects a vision of Otay Mesa in which the site hosts an eclectic and dynamic center for border commerce, trade and industry. Programming of matrix fields is the key to achieving this vision.

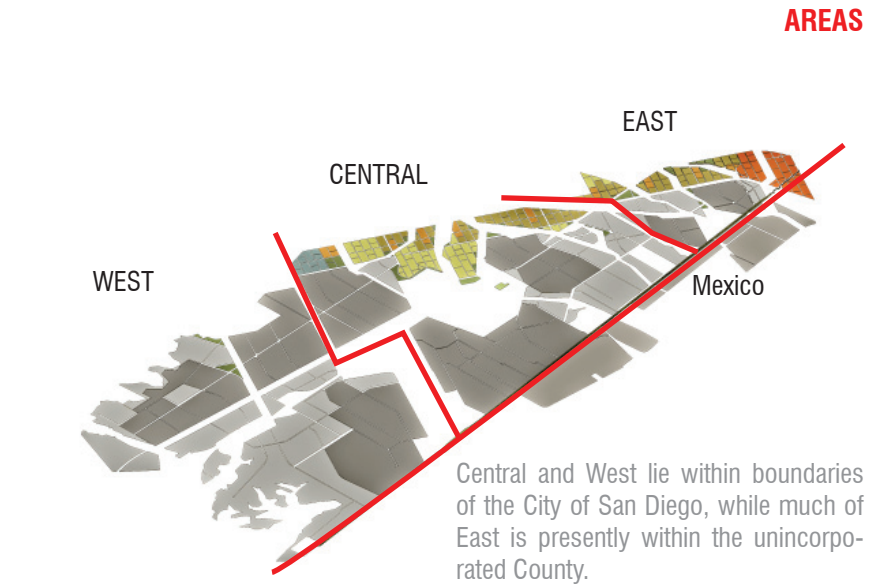
The frames and the matrix field enable and facilitate the development of diverse programs in relatively close proximity to one another, creating opportunities for creative programming. Just as matrix fields are not conventional zoning designations, building programs for the programmed fields (“cells” or “neighborhoods”) are not intended to be simple outcomes of permitted development types. Each cell is intended to be a mixed-use area with policy or rule-based tendencies as opposed to canonically legislated outcomes. The precise mix of programs, however, depends on the somewhat unpredictable interaction of market outcomes and the types of “trigger” guidelines, discussed in previous chapters.

Given this, it is not possible to categorically provide a land-use mix for the entire site. Rather, this section attempts to extrapolate a “likely” scenario, based on the frame and ma-

trix specifications discussed in the reSTRUCTURE chapter, the design intentions and triggers articulated in the reTRANSFORM chapter and, by way of comparison, the SANDAG forecasts which informed the City of San Diego’s site-planning process for its part of the site¹.

Overall, this projection suggests that the vision plan’s recommendations would result in a denser, finer-grained and more compact outcome than would result from the official proposals for the site presented to-date, while achieving or, in some cases, somewhat exceeding the official aggregate employment and housing targets. Due to the higher densities supported by the proposed infrastructures, the plan would anticipate a substantially greater amount of conserved open space (including correspondingly less infringement on MSCP territory) and recreational parkland than would be set-aside in the City and SANDAG visions.

¹ The City and SANDAG intentions are presented in the SANDAG’s draft *Plan Estratégico del Corredor Binacional Otay Mesa – Mesa de Otay* (2005, 2006, SANDAG’s *Cross Border Collaborative Planning in Otay Mesa* and *Early Action Plan* (2006), and the City of San Diego Planning Department’s (2006) *Otay Mesa Community Plan Update*.



Central and West lie within boundaries of the City of San Diego, while much of East is presently within the unincorporated County.

This chapter is divided into three sections, following this introduction: (i) cell programming, which presents a “realistic worst case” land-use and density outcome; (ii) phasing, which describes how the plan may be progressively implemented over forty years; and (iii) a comparison of plan outcomes versus SANDAG targets.

Reference is made in this chapter to programming categories, which maybe defined as follows:

housing - primarily multi-unit or townhouse residential buildings in a range of densities from 30 to 165 units per

hectare (12 to 65 per acre);

social - buildings where the primary program is educational or social service (schools, creches, community centers, etc);

state - government offices and facilities, including customs, immigration and police;

hospitality - refers only to hotels, conference centers, hostels and transient worker housing;

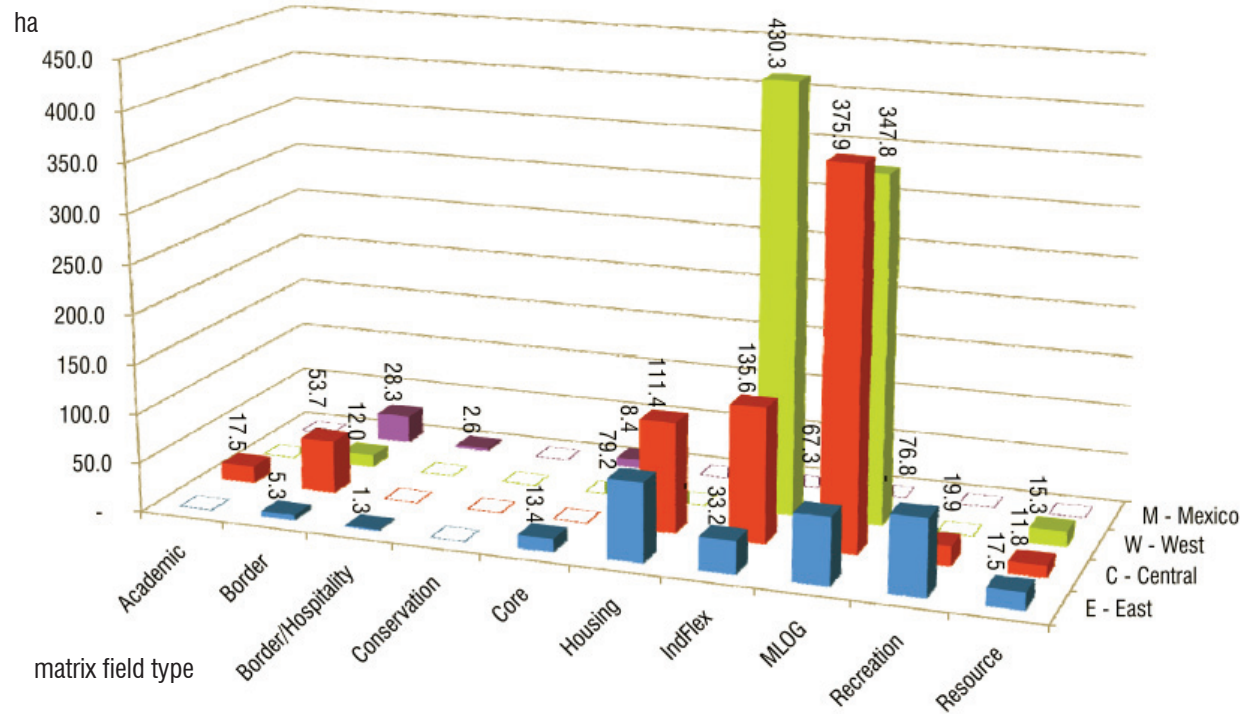
industrial - industrial, industrial flex, logistics/warehousing and research & development typologies; and

recreation - structured outdoor park Definitions for **office & retail** generally to their common meanings.

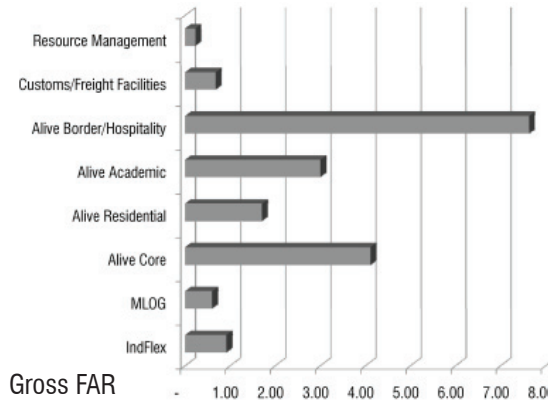
PROGRAMMING

The table to the right presents a “realistic worst case” land-use outcome. Again, it should be noted that the “matrix field” types are not exclusive land-uses and each contain a mixture of building types and programs, as articulated in the “Programming by Field Type” and “Programming by Use Mix” graphs below. The “Average Gross Floor Area Ratio by Field Type” graph suggests one possible scenario of the average density of built programs, although it is somewhat deceptive in that each “field type” does not each have an equivalent quantity of land associated with it. For example, the Border/Hospitality field appears to have exceptionally high density because it contains only a single highrise hotel and confer-

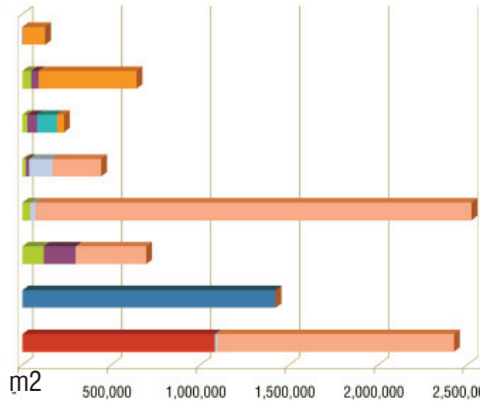
FIELD TYPE BY AREA



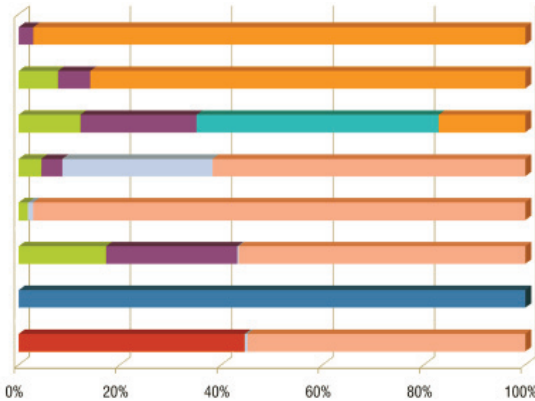
AVG GROSS FLOOR AREA RATIO BY FIELD TYPE PROGRAMMING BY FIELDTYPE



PROGRAMMING BY FIELDTYPE



PROGRAMMING BY USE MIX



PROGRAM:



ence center.

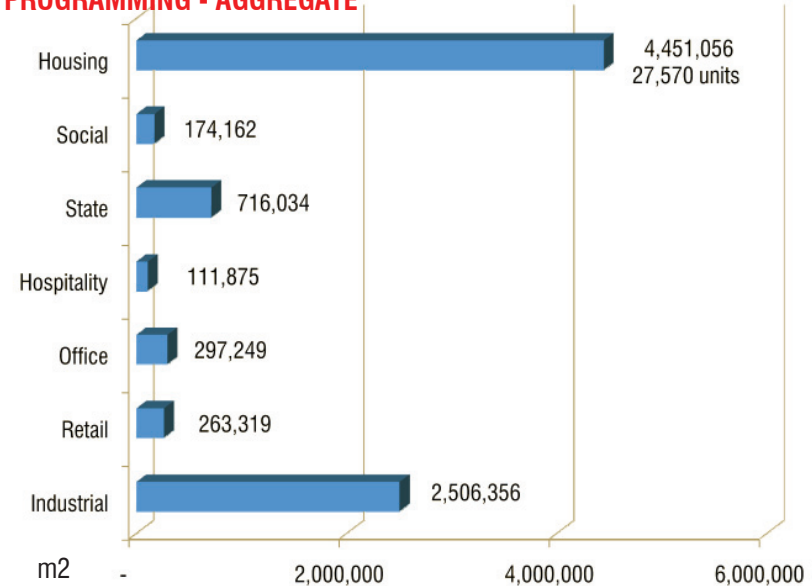
The table on the right illustrates the aggregate build-out building floor-space classified by programming. Housing is given both in terms of aggregate square meters of gross floor-space and the number of units.

Below, housing units are given for each of the development areas. Units in Mexico are contained within the Las Torres side of the Alive Trade City, which is presumed to be redeveloped as a mixed-use district. That neighborhood presently comprises largely of informal housing stock.

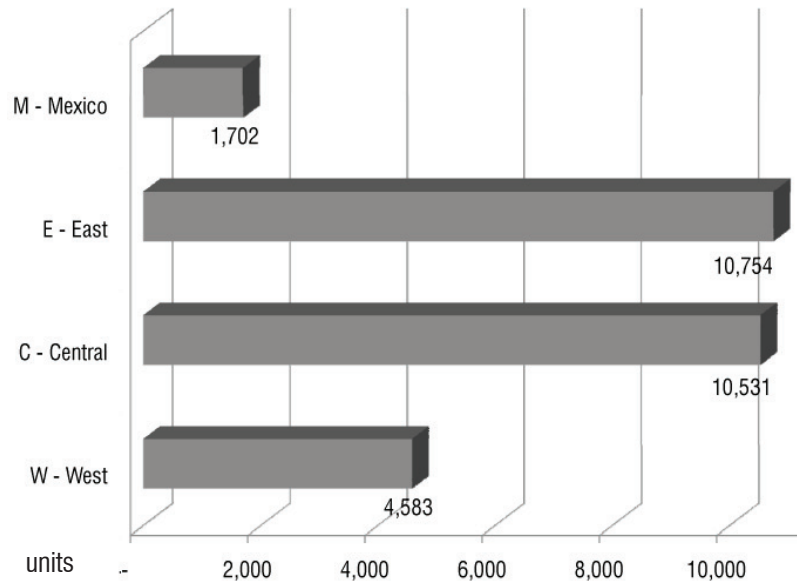
The third table illustrates the distribution of building program types by floor area for each area.

Housing totals do not include units already constructed in the western canyon area of the City's Otay Community Planning District, which are excluded from this study altogether. Industrial, office, state, and retail totals, however, include all already-developed sites on the US mesa proper. These areas are assumed to remain as-is or to be progressively redeveloped and densified through build-out.

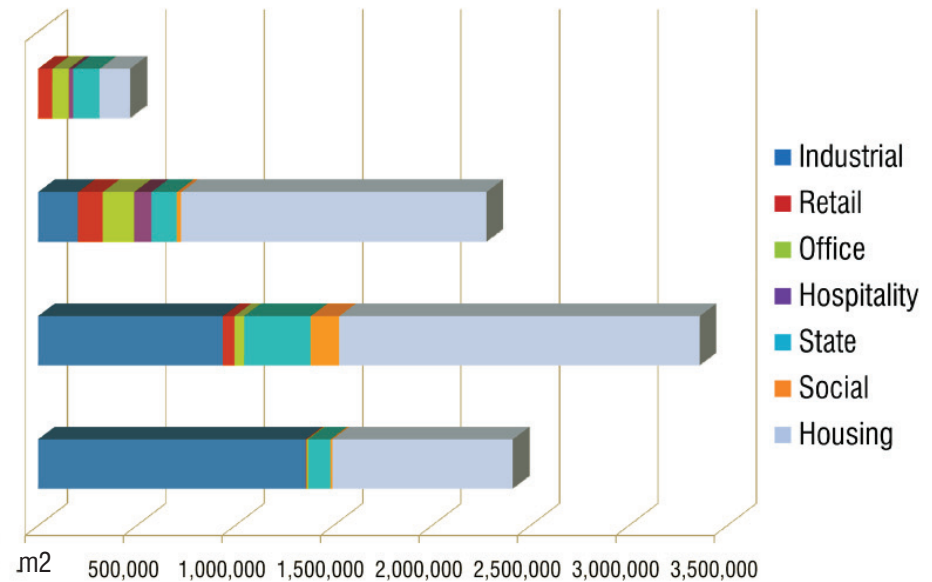
PROGRAMMING - AGGREGATE



HOUSING UNITS BY AREA



PROGRAM DISTRIBUTION BY AREA



START

(i) begin process of buying out and re-mediating contaminated *yonkes* and other contaminated sites **A**; (ii) complete SR-905 and SR-125 **B**

PHASE 1 - yrs 1-10

(i) develop Wall+ & green frames **A**; (ii) construct east BRT/trolley line, connecting to Carmel Ranch **B**; (iii) develop Otay East POE **C**; (iv) develop Alive Trade City around POE **D**; (v) develop housing field, redevelop MLOG fields next to POEs **E**

PHASE 2 - yrs 11-20

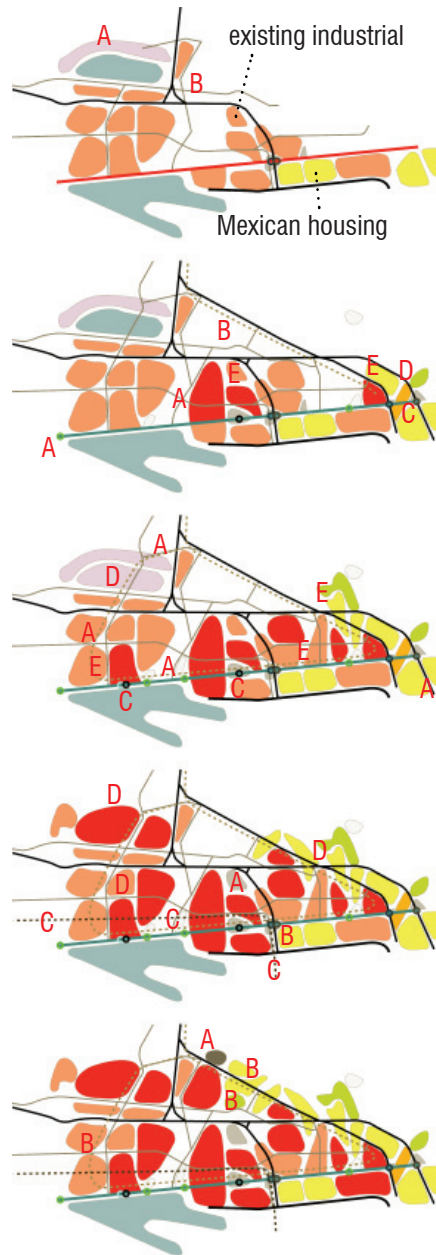
(i) rail BRT/trolley rail loop & freight tram **A**; (ii) implement resource exchange centers; (iii) develop container conveyor & airport terminals **C**; (iv) close Brown Field, begin remediation **D**; (v) continue matrix development/redevelopment **E**

PHASE 3 - yrs 21-30

(i) redevelop Integrated Customs Facility **A**; (ii) redevelop Otay West POE as exclusively non-freight **B**; (iii) develop BNSF short line Mexico link with freight terminals recycling POE truck facility bldgs **C**; (iv) continue matrix development **D**

PHASE 4 - yrs 31-40

(i) develop college/technical institute **A**; (ii) complete matrix development and programming **B**; build-out



PHASING

The plan is intended to be progressively implemented over four decades. This is a somewhat longer than the phasing of the SANDAG plan, which assumes buildout in approximately 2030.

During the first decade, the water reclamation system contained in the wall will be developed as well as other key infrastructures such as the new POE and SR-11 link; however, it is anticipated that some major projects will not occur until later phases.

For example, the plan assumes the eventual closure of Brown Field, but not until expansion of Tijuana International airport and construction of cross-wall passenger and freight capability. The container conveyor and freight tram recommendations are also assumed to be built during Phase 2.

Other major infrastructure projects outlined in the Draft Goods Movement Plan (SANDAG, 2007) are anticipated to occur much later, including the proposed freight rail expansion, first to the *mesa* and then to connect to the SD&AR across the border. Later MLOG fields are

expected to include the large scale freight village-type logistics centers anticipated in the SANDAG plan, and pre-suppose greater containerization of cross-border trade in the future.

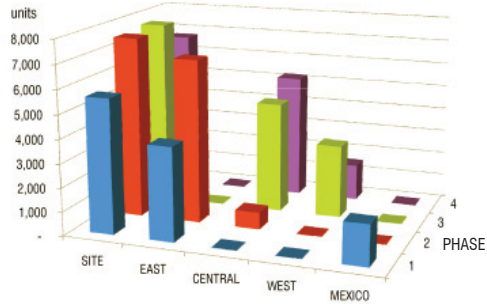
The site will be progressively developed over the entire development period, and at no point will historical real estate absorption rates be substantially exceeded. Redevelopment of existing industrial sites is expected to occur only upon the obsolescence of existing buildings, and wherever possible, the plan assumes that existing structures will be recycled, particularly in the Indflex fields.

The plan proposes the development of a major educational institution on the site in Phase 4, once a critical mass of new residents and workers have already been reached. This institution, which may be a community college or, possibly, a satellite campus of a major San Diego or Tijuana school such as San Diego State University or the Instituto Tecnológico de Tijuana, or perhaps a joint venture of both. The focus of such an institution would be development of human resources for the *maquiladoras* and other industries.

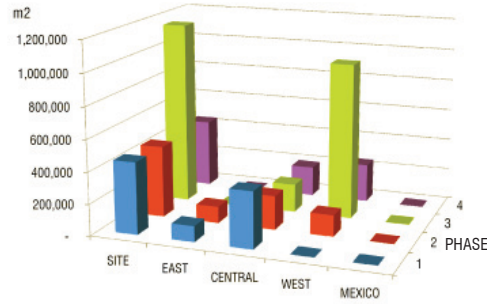
A detailed analysis of building and

PHASE DEVELOPMENT BY PROGRAM

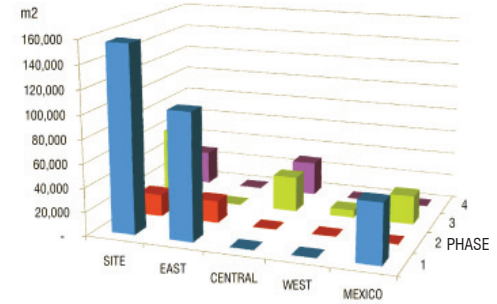
HOUSING UNITS



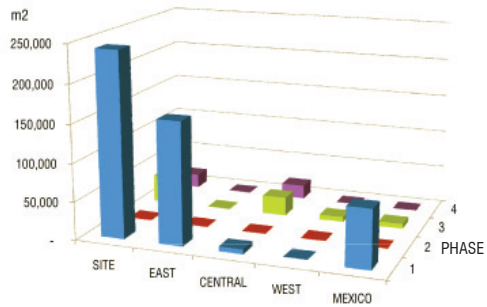
INDUSTRIAL



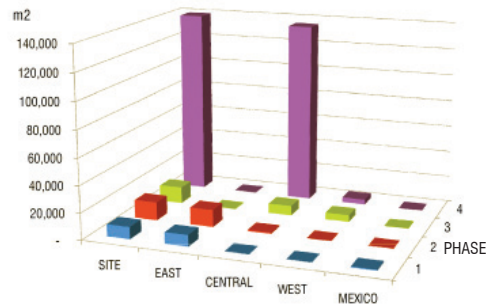
RETAIL



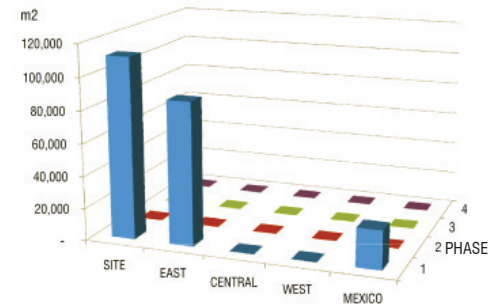
OFFICE



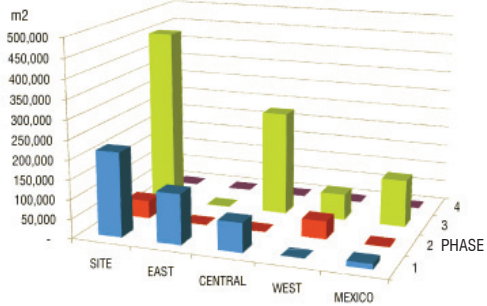
SOCIAL



HOSPITALITY



STATE



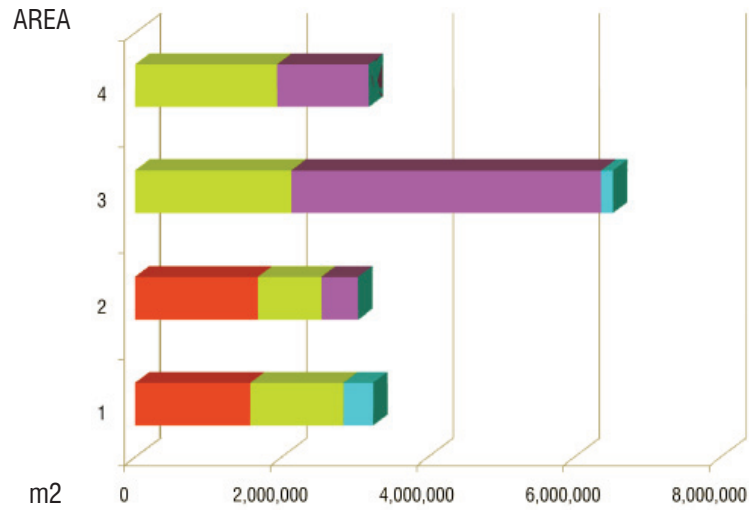
floor space development by program type, phase and area is given in the graphs above and to the left. Note that “industrial” includes both Indflex-type light industrial and research programs as well as manufacturing and advanced logistics facilities programmed for the MLOG fields.

Graphs on the following page provide

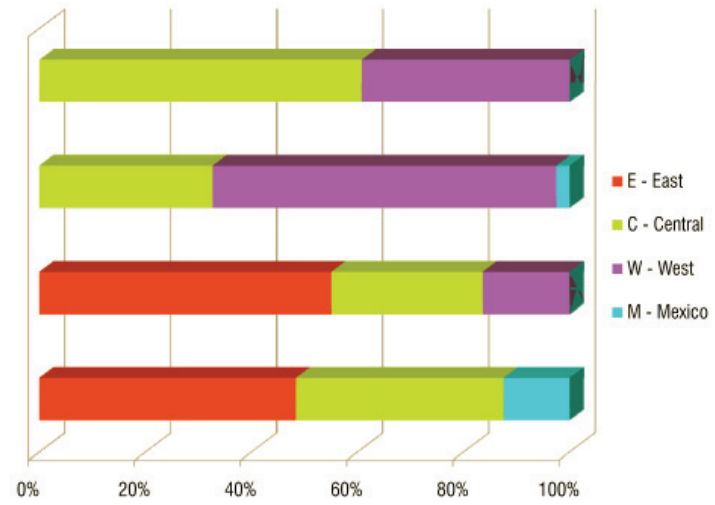
more details about phasing and programming, including a projection of the number of new jobs created on the site, by decade, through build-out.

Note that all of these projections may vary substantially by the final phase, depending on the amount of program “flex” in the Indflex fields.

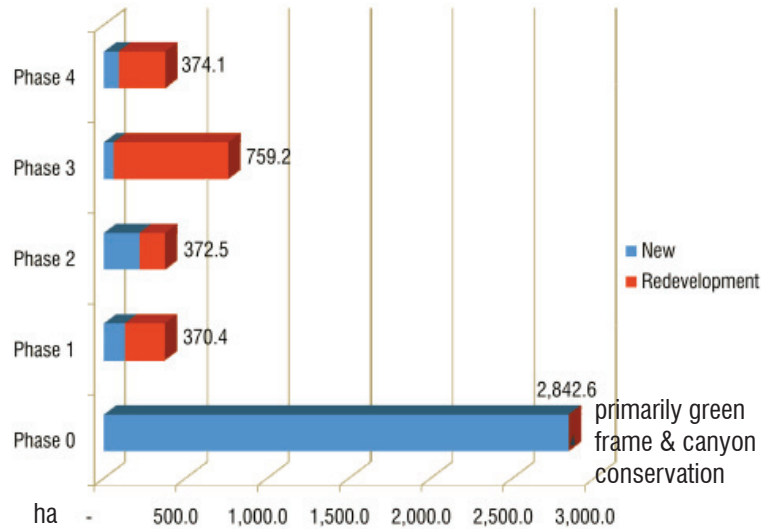
PHASE DEVELOPMENT BY AREA



PHASE DEVELOPMENT DISTRIBUTION BY AREA

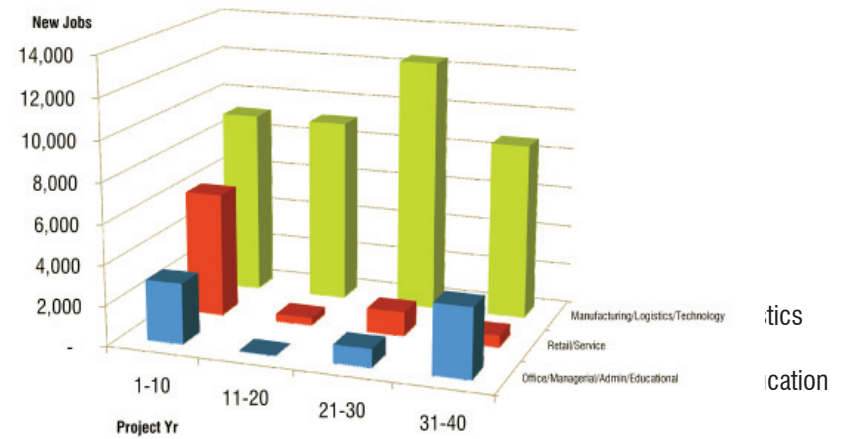


AREA DEVELOPED BY PHASE & DEVELOPMENT TYPE



EMPLOYMENT CREATED

excludes construction & government



COMPARISON/VALIDATION

Graphs on the two following pages attempt to compare development under the vision plan to SANDAG and City of San Diego projections for the site. Development of the Mexican side, mentioned earlier in this chapter, is excluded in this section.

The “official” scenario is derived from land-use, employment and population projections for both the City and County regions. At present, the draft SANDAG plan calls for a substantial portion of industrial development, including heavy industry, to occur in the unincorporated portion of the site. SANDAG also projects the development of very low-density ranchettes in the eastern foothills, which has the overall effect of materially lowering the blended housing densities of the “official” projections. No ranchette development occurs in the vision plan and the space is allocated to community parkland or added to MSCP conserved areas.

The vision plan differs significantly in the total amount of land developed in that it assumes conservation of the green frame and virtually all of the undeveloped portion of the ecologically sensitive western canyon area,

where the “official” plan focuses most of its medium density housing. Instead, the vision plan proposes to concentrate housing development on the site’s eastern flank (Alive).

Total projected housing units also differ substantially, with over ten thousand additional units developed under the vision plan *vis-a-vis* the baseline SANDAG scenario. The excess housing units in the vision plan may be attributed to the Indflex fields. SANDAG assumes that the *mesa* proper will be developed almost exclusively as industrial and logistics programming, with, perhaps, some big-box retail, while the vision plan provides the later-phase option of “flexing” some of this industrial program into residential and commercial villages based around converted/re-developed warehouse areas.

Despite this reduction in total industrial program space, employment projections for the two scenarios are similar. The vision plan, by proposing development of a border-trade-and-commerce-oriented core (the Alive “Trade City”), makes up for the foregone industrial jobs with additional office, administrative, institutional and retail employment. The vision plan anticipates on-site housing

for virtually all employees.

The presence of the Trade City, and the regional border-oriented retail and hospitality/convention programs it will contain account for the vision plan’s much higher daytime population. Under this scenario, the southern end of the Alive neighborhood will become a regional visitor magnet instead of just a pass-through area for border crossers. In addition the convention/conference facilities and the proposed academic institution will hopefully generate nightlife and cultural activity as well.

Real Estate Market

The vision plan sought to reality-check projections against local real estate market conditions.

As of 1st quarter, 2007, Otay Mesa’s industrial inventory was approximately 1.2 million square meters (“m2”) (13.2 million square feet). Total metropolitan industrial inventory was 3.0 million m2 in the US plus another 4.2 million m2 in Tijuana¹. Annual industrial absorption on the US side has recently ranged

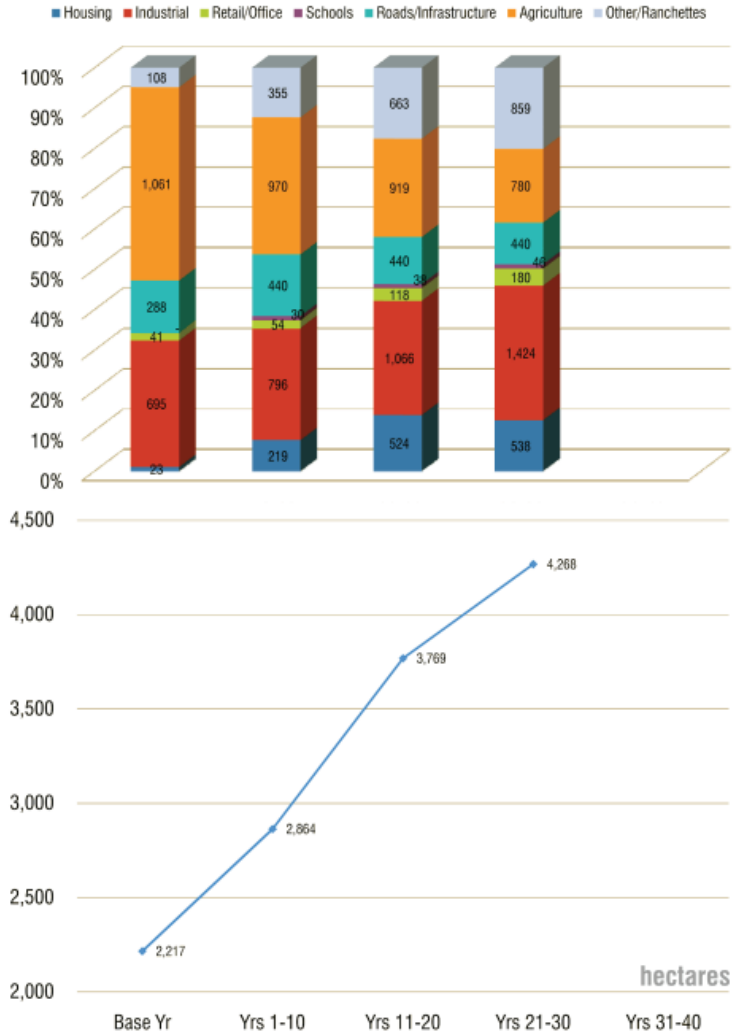
¹ Grubb & Ellis Research, *Industrial Market Trends San Diego*, Second Quarter 2007 for the US; Maquila Properties Inc, *2006 Tijuana Industrial Real Estate Update* for Mexico.

from 100,000 to 300,000 m2, while Mexican absorption has ranged from 80,000 to 400,000 m2.

If nearly the entire flat *mesa* was reserved for industry as anticipated in the SANDAG plan, by build-out, the site’s inventory would approximate the entire current bi-national metropolitan inventory combined, implying an annual on-*mesa* absorption level of 200,000 m2. The vision plan assumes new on-*mesa* inventory of 1.3 m2, on top of the existing level, which, even assuming redevelopment of 100% of the existing inventory, implies a more conservative annual absorption of 30,000 m2.

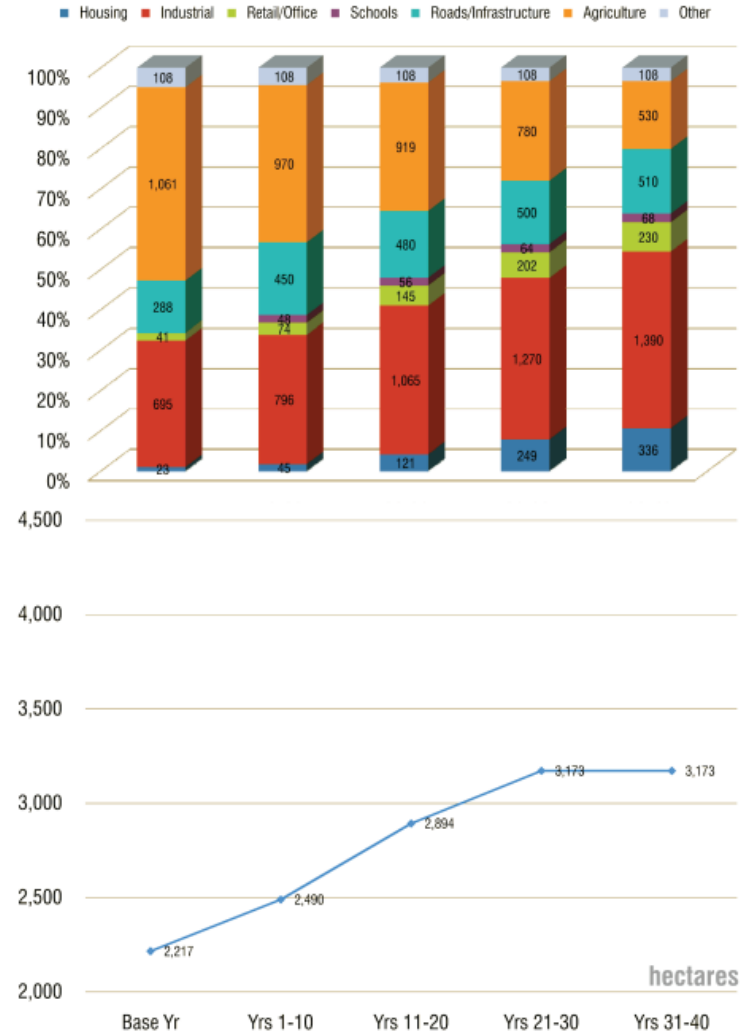
Should the SANDAG plan’s extremely high level of industrial demand materialize, then the “flex” into housing anticipated in the vision plan will not occur. However, for this to happen, the City will have to undergo a significant and sustainable manufacturing renaissance. While the higher level of absorption implied by the SANDAG plan may be reasonable in the near-term, especially given the recent commitments of several large Asian automobile manufacturers to build assembly plants on the Tijuana side of the *mesa* and a recent trend toward capital manufacturing invest-

SANDAG PROJECTION



based on 15,275 ha total site area, with 10,516 ha open or conserved, including constrained space

PROPOSAL MODEL



based on 15,275 ha total site area, with 12,102 ha open or conserved, including constrained space

ment in the metropolitan area by Chinese companies², it seems unlikely that this rate could be maintained.

At present, San Diego has roughly 7.0 million m² in retail inventory or approximately 2.1 m² per resident (0.8 m² per household)³. The vision plan assumes approximately 2.9 m² per resident in new retail, which is 35% higher than the metropolitan average; however, much of this new retail space is targeted at regional cross-border traffic. Additionally, annual retail absorption in the South Bay (the communities immediately proximal to the site, which are all approaching build-out) has been around 13,400 m², and the vision plan anticipates new on-mesa retail to be absorbed at an annual rate of only half that level (6,500 m²).

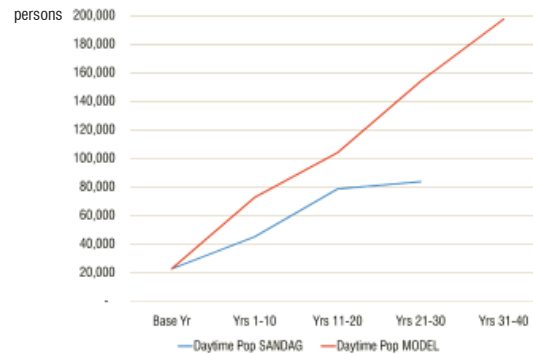
The vision plan projects 297,000 m² of new office inventory over 40 years, equivalent to 4.9% the US metro inventory⁴. Peak annual absorption for this new commercial center would be 13% of the metropolitan average.

2 e.g., “Automaker’s Plan For Tijuana Has Firm Scrambling”, *San Diego Business Journal*, 7/9/2007.

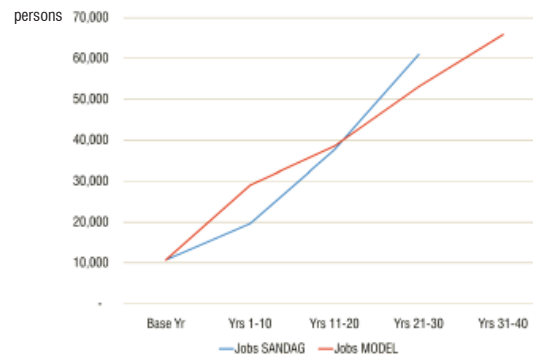
3 Grubb & Ellis Research. *Retail Market Trends San Diego*, Mid Year 2007.

4 Grubb & Ellis Research. *Office Market Trends San Diego*, 2nd Quarter 2007.

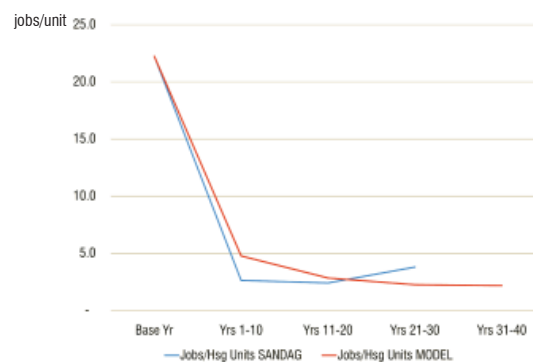
DAYTIME POPULATION



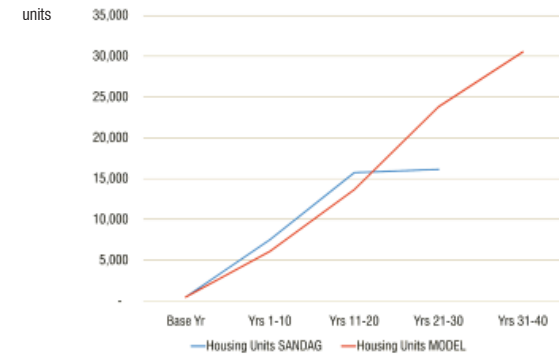
EMPLOYMENT



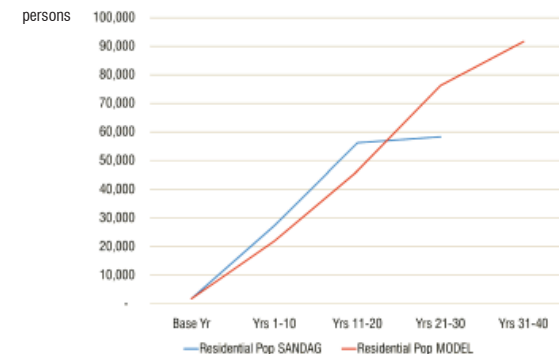
JOBS/HOUSING UNITS



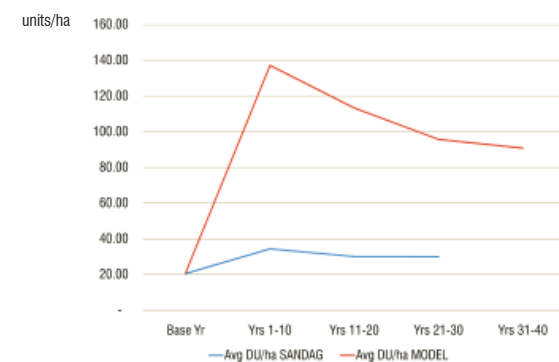
HOUSING UNITS



RESIDENTIAL POPULATION



HOUSING UNIT DENSITY



reFUSION

fusion scheme

alive trade city

alive crossing

alive marketplace

alive residential

indflex

MLOG

FUSION SCHEME

The rePROGRAM chapter demonstrated how the matrix fields may be programmed to become cells/neighborhoods, in aggregate. The objective of this chapter is to illustrate how these program mixtures may relate to urban form.

Developing the entire site at urban densities would require a radical redefinition of the city, on the scale of IC-SUSD's bold 2003 master plan for Otay Mesa. For example, if one was to develop the entire 4,719 hectare site at, say, the 2005 density of neighborhoods in Centre City San Diego, one would have to add 225,000 residents and 645,000 employees to Otay Mesa. At Centre City's 2015 projected residential density -- the density at which neighborhoods like the Marina District and Little Italy are currently being built-out -- this would equate to 683,000 new residents.¹ At densities typical of Tijuana's more crowded *colonias populares*, this

¹ As of 2005, the Centre City Development Corporation gives Centre City's residential density at 47.6 persons/ha and its employment density at 136.7 persons/ha. The 2015 projected residential density is 144.8 persons/ha.

would equate to 2.5 million new residents². Even if there was demand for such development at Otay Mesa, the environmental and resource consequences for doing so would be extremely high, and the city's objective of preserving much of the *mesa* for the development of industry and logistics and for habitat conservation would be obviated. Clearly, the urban design intent here is not to cover the entire *mesa* with residential towers or perimeter blocks.

Design Considerations

The objective of this chapter is to project what manner of place could emerge over time by adherence to the principles and procedures articulated in the reTRANSFORM, reSTRUCTURE and rePROGRAM chapters of this vision plan. The intention is not to present a fully resolved set of architectural designs for the site's southeastern corner.

The fusion of urban design intentions into tangible urban form is a complex process. The projections here are based on previously articulated design intentions. The indicative pro-

² As of 1990, residential densities for areas of Tijuana classified as "urban" was around 534 persons per hectare (CONAPO).



Kilometers of ad hoc red-roofed tianguis (market stalls) clustered on sidewalks near Otay West POE are sustained by the intensity of border crossers in need of services. *both images on this page, Google Earth 2007*

gramming calculations behind the graphs presented in the last chapter, and the additional application of urban design principles that only emerge as relevant at block scales, which, up until this point, the vision



As indicated by the curves, POEs such as Otay West are designed for high velocity.

plan has not sought to address.

The overriding block-scale urban design principles are intensity, velocity, activity, sustainability and identity.

INTENSITY - One need only look to the *ad hoc* blocks of *tianguis* south of the formally-zoned industrial and commercial areas north of the Otay Mesa West POE, to see the type of bustling urban intensity that might be generated when a crushing mass of people and vehicles converging on a single point (POE) is activated by urban design:-- even temporary unplanned urban design that requires users to cross multiple lanes of traffic, under dangerous conditions to access. Such constant volumes of people require food, refreshment, lodging, trading opportunities and even entertainment diversion.

Public and retail space in the Alive Trade City should capture these intense volumes with a wide range of easily and safely accessible formal and informal programs, as well as usability and visual interest.

Similarly, subgroups of these visitors will want to engage in commerce relating to the surrounding industry, which draws them to the crossing

point in the first place. They should be given the venues and services necessary for them to do so onsite.

Other fields will experience much lower levels of intensity, such as conserved open space, manufacturing areas and housing neighborhoods, and their design should reflect this reality.

VELOCITY – High velocity is a fact of life for a POE, with millions of users constantly passing through, attempting to move quickly from points of origin to their final destinations or to quickly meet and do business with cross-border associates. The program mix and its form in the Alive Trade City has to reflect and accommodate this fast pace, in order to capture the commerce of these users.

This being said, the observed velocities of the site will vary substantially across locations:-- all areas cannot expect to attract, or even want to attract, this pace, and there needs to be clear acknowledgement of this diversity in design. POEs on the wall and the commercial fields immediately adjoining them, as well as the high volume components of the access infrastructure frame must ac-

commodate the highest velocities, providing easily accessible services, venues and diversions for workers and visitors who may only be there for minutes or hours³. Other places, such as the green frame, may consist of large tracts of sedate open space. Still other areas, such as residential, logistics and manufacturing fields, may operate best at intermediate velocities.

ACTIVITY - Healthy public spaces require a broad range of activities, spread appropriately across a day's hours, and adapted to a given neighborhood's intensity and velocity. Fine-grained mixed use environments, with a diverse mix of programs accessible in relatively close proximity to each other, will help optimize the amount of visible activity in each type of area, creating attractive public spaces which draw users to them.

The absence of visible activity makes much of the site as it is today feel tenuous, or even threatening. In particular, activating the wall, especially at the POEs, will decrease the prospect of illegal crossing and crime:--
3 This being said, urban design may certainly attempt to convince them to extend their time there, for longer: -- something they are not encouraged to do today.

presumably, drug and human traffickers would be far less inclined to breach a segment of the wall in clear view of a prosperous 24/7 plaza with cafes filled with border visitors from all walks of life than they would the dark backside of an 8-hour-a-day warehouse. All neighborhoods, save for perhaps those segments of MLOG fields with largely automated industrial processes, should be designed to attract and sustain relatively high levels of pedestrian and other human activity.

SUSTAINABILITY - A fourth set of considerations relate to environmental sustainability in design. Site-specific considerations relating to hydrology, water supply and wastewater treatment have already been addressed. Similarly, opportunities for resource/materials/by-product exchange; eco-industrial planning; green supply chains; renewable power generation; transportation-use-mitigating density; freight traffic mitigation and noise/emissions management/buffering measures; mixed-use development patterns; and the availability of fixed-guideway access systems for both people and freight will all serve to enhance sustainability objectives. Sustainability may also be contained in community design:-- the proximity

of air-quality-improving green lungs to use-intensive areas, the hierarchically optimized hydrology of tiered water systems interacting with urbanized spaces, and, most relevantly for this chapter, block design which exploits climate and other natural systems to facilitate livability.

Block-level “green-building” systems should be included wherever possible. Buildings should take maximal advantage of daylighting opportunities, particularly the northwest-southeast facing orientations on the Alive topographic incline. South facing exposures provide opportunities for shaded balconies, street canopies, casements, louvers, courtyards, and semi-permeable courtyard walls, water heating systems, and solar cells, which, when deployed properly, also serve to enhance one’s visual experience. North-facing exposures benefit from more direct transparency and permeability:-- courtyard openings, glass facades, larger windows and so forth.

In Alive, the placement of garages under graded blocks, necessarily terraced to accommodate the terrain, provides an opportunity for reduced artificial cooling costs in the buildings above with the addition of ad-

equate insulation and concrete thickness between the parking level and ground-floor building courtyards. These terraces maybe penetrated, where appropriate, with heat chimneys. Central airconditioning for lowrise non-elevator buildings in San Diego is uncommon as a standard fixture, but even these structures -- which will be the most common type on the site -- will be more comfortable with such systems in place, than without.

Taller buildings should be developed with natural air ventilation, exploiting these principles, whenever possible. Similarly, in the MLOG and inflex fields, high ceilings, heat chimneys, green roofs and roof construction materials may all be deployed to create more pleasant environments.

All of these features serve to facilitate the maximization of development densities, where appropriate, and to allow a broad mix of programs in areas where, previously, only low-intensity (and heavily automated) industrial and logistics processes could be accommodated. By restructuring the built and non-built landscapes with sustainability in mind, it will become possible to redevelop Otay Mesa as an attractive collection of

urban neighborhoods.

IDENTITY - A fifth set of considerations relate to cultural identity. The position of development, on the border, anticipates that the mix of users will reflect all of San Diego/Tijuana’s diverse communities⁴ as well as the international expatriate communities who participate in the local pattern of industrial production, principally from Northeast Asia. Herzog (1999) gave the following typology of culturally-derived architectural adaptations or hybridizations that are common in San Diego/Tijuana’s design vernacular, which are summarized and interpreted here and expanded upon in the design work shown below:

- (i) **border town** - designs that evoke the idea of the border, including the corresponding motifs of impermanence, transiency and the frontier;
- (ii) **arquitectura del chiste** - favor-

4 The current population distribution of the South Bay area of San Diego County (San Diego, Chula Vista, National City and Imperial Beach) is an indication of one measure of diversity, ethnic origin, for the population which will likely use the site:-- by 2007 estimates, the distribution of residents is approximately 50% *Latino*, 29% *Anglo* and 13% Asian, with the demographic pyramid rapidly shifting the balance in favor of the first and third groups (*SANDAG Fast Facts*, 2007).

ing of colors, motifs, materials and forms that feature whimsy and fancy as central elements;

(iii) **placa** - the use of large murals as both art and advertisement, as a dominant facade feature above the ground floor of buildings;

(iv) **glorieta** - in Tijuana, traffic circles featuring monumental sculpture, possibly now spreading to the US side;

(v) **amontanado** - horizontal layering of facade or, tectonically, structural elements, possibly in different colors or with different materials;

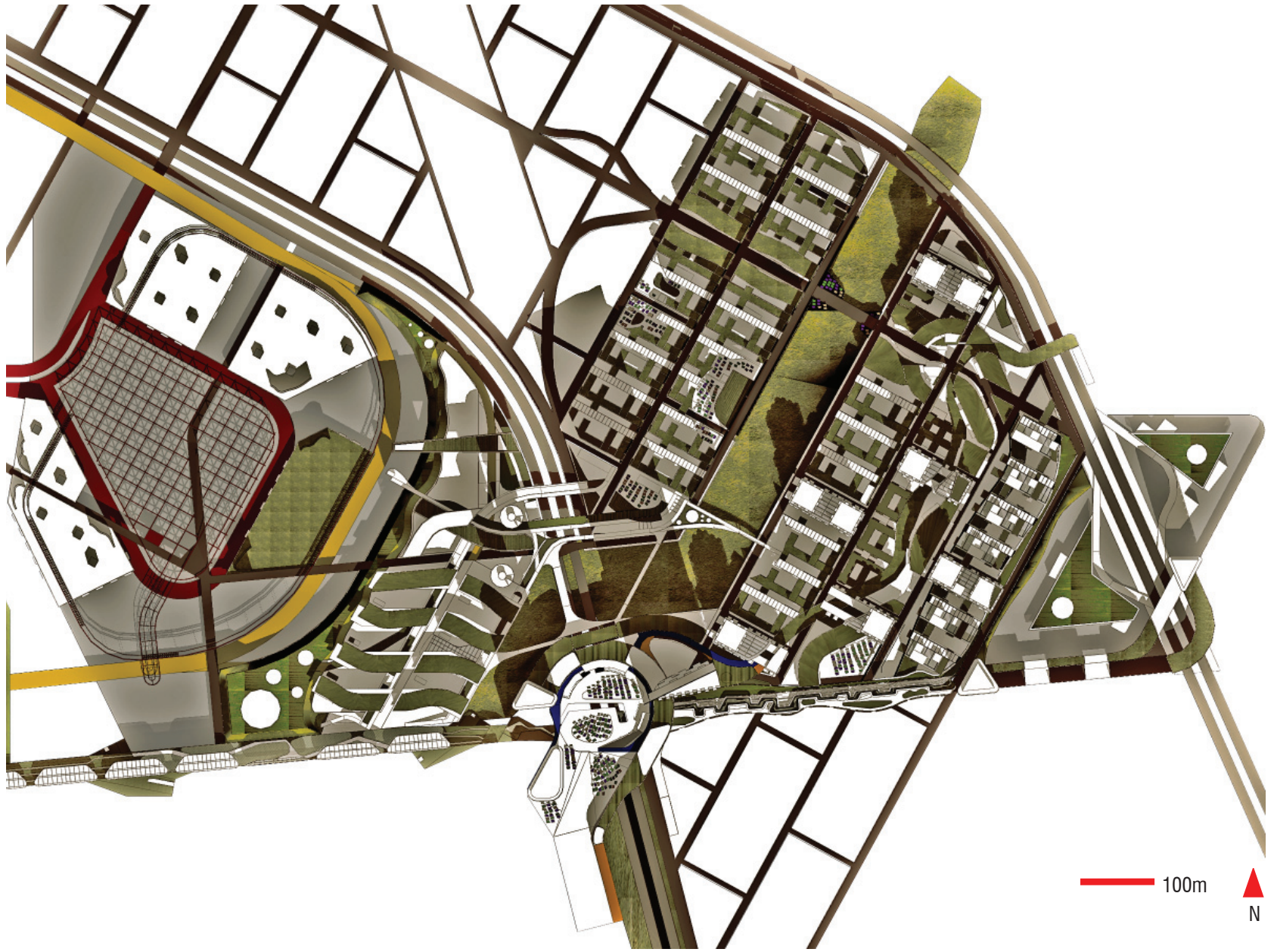
(vi) **Latino Urbanism/New Urbanism** - a concept, only tangentially related to “New Urbanism” suggesting cultural predilections toward density, certain color schemes, dynamic street life, public spaces, forecourts, pedestrian-oriented-design, and intergenerational housing⁵;

(vii) **waste recycling** - buildings from recycled elements;

(viii) **cross-border interactive circuits** - such as through the San Ysidro/Zona Norte POE; and

5 for different definitions, see Michael Mendes (2000). *Latino Lifestyle & the New Urbanism: Synergy Against Sprawl*, DUSP MCP Thesis. Cambridge, MA: MIT. and James Rojas (1991). *The Enacted Environment: The Creation of Place by Mexicans and Mexican Americans*, DUSP MCP Thesis. Cambridge, MA: MIT.

OTAY EAST: ALIVE & ENVIRONS - PLAN VIEW

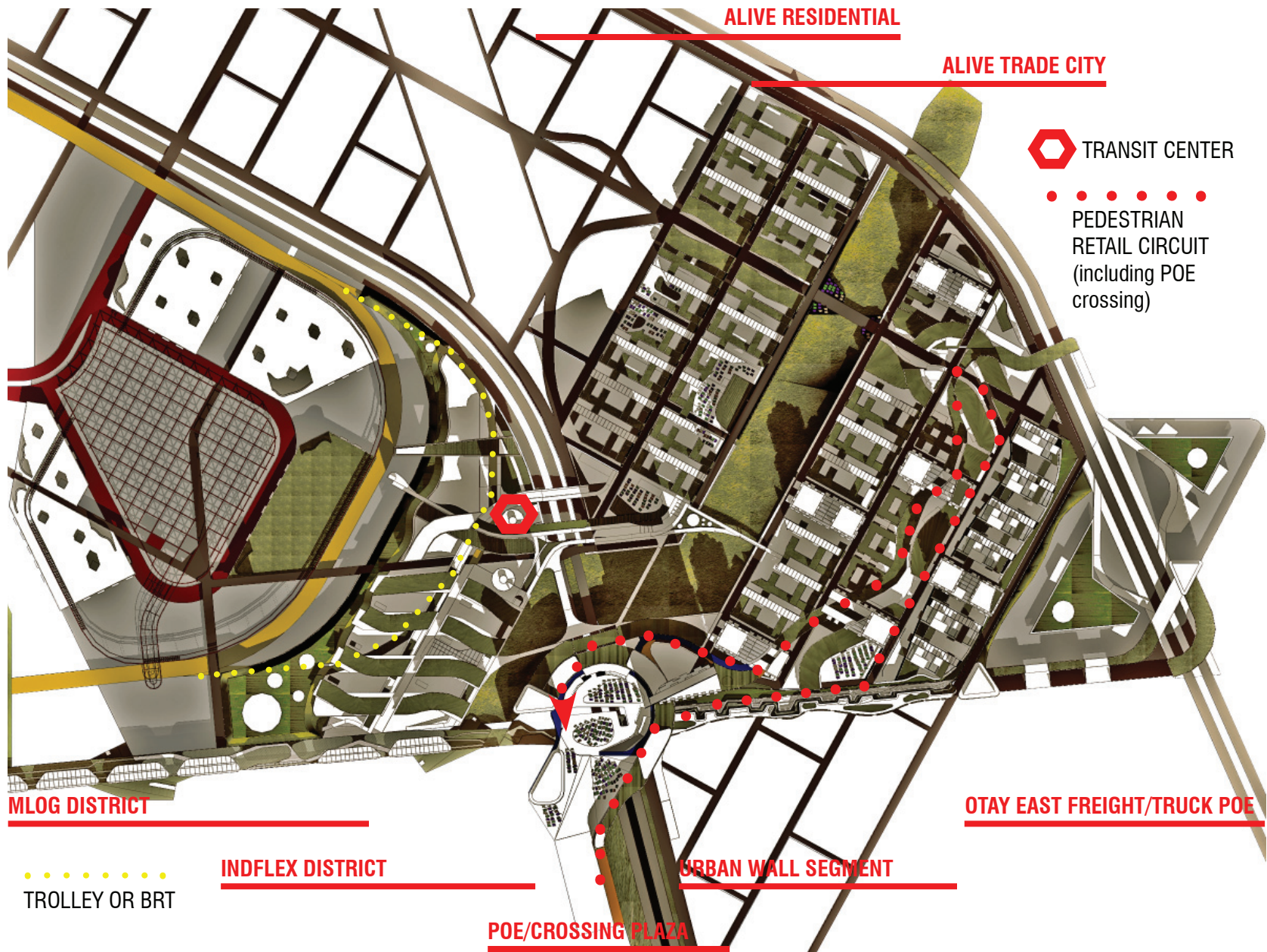


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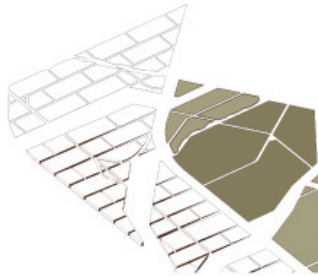


OTAY EAST: ALIVE FROM NORTHEAST

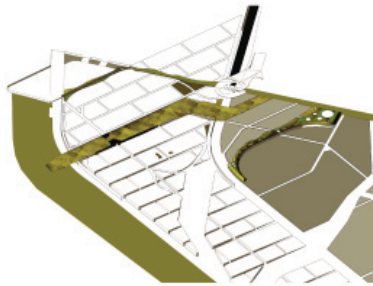
OTAY EAST - KEY CIRCULATION PATTERNS



LANDFORM MATRIX

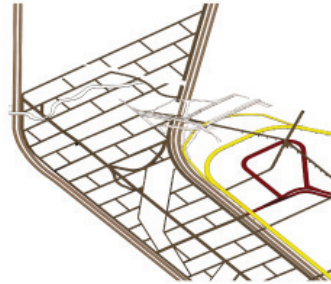


BLOCK STRUCTURE

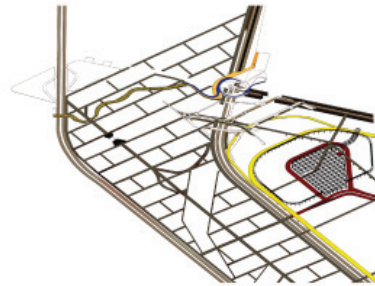


LANDSCAPE INSERTIONS

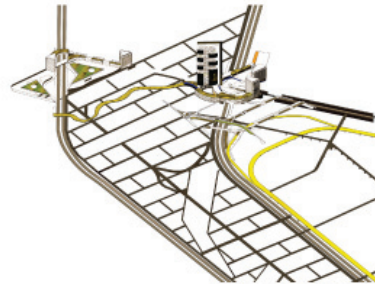
MOBILITY MATRIX



VEHICLE & RAIL SYSTEMS

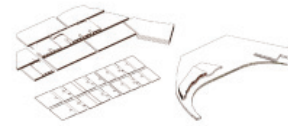


PEDESTRIAN & FREIGHT SYSTEMS

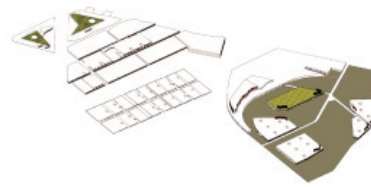


CROSSING SYSTEMS

BUILT FIELD



SUBSURFACE STRUCTURED PARKING



SURFICIAL PLATFORMS



RETAIL/INDUSTRIAL/FLEX DVLPT



COMMERCIAL/HOSPITALITY DVLPT

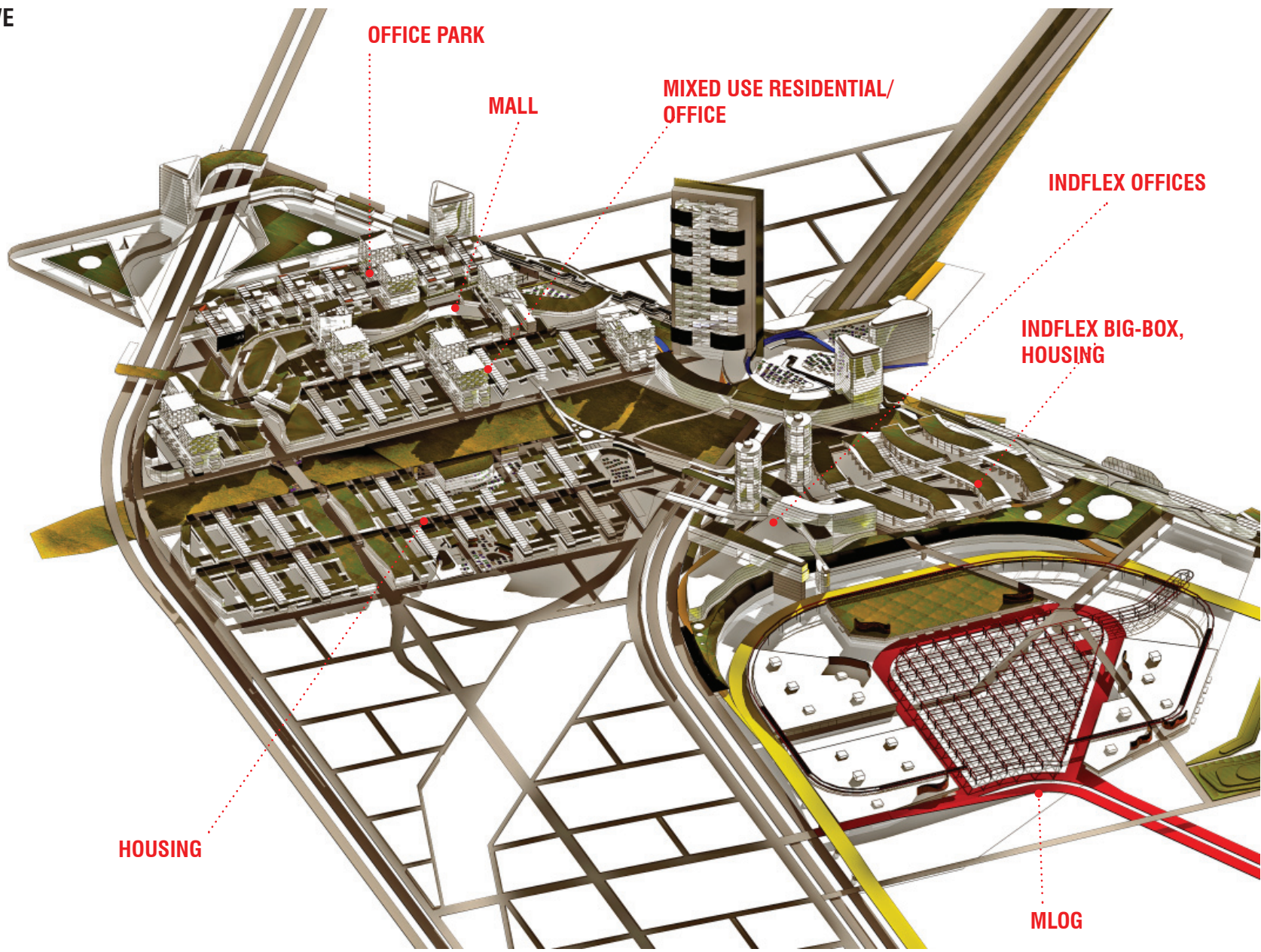


HOUSING DVLPT

**OTAY EAST
EXPLODED SITE
AXONOMETRIC**

ALIVE

ALIVE TRADE CITY & ENVIRONS



(ix) **zocalo** - market plazas as organizing principles in urban design.

In addition, the ubiquitous use of open-air courtyards as an organizational element in nearly all building types, and arcade-like canopies should also be noted. Another design consideration is San Diego's perceived geographical and cultural retail market fragmentation and the relative unwillingness of fickle consumers to travel beyond their immediate neighborhoods for price and

choice advantages.⁶

The overriding design objective of the Alive neighborhoods is to provide a setting where evolving means of cultural adaptation, differentiated lifestyles and urban space usage patterns, and processes of hybridization may play out, constructively and creatively over time.

⁶ e.g., Green, Frank (2003), "Hungry for Sales", *San Diego Union-Tribune*, May 18.

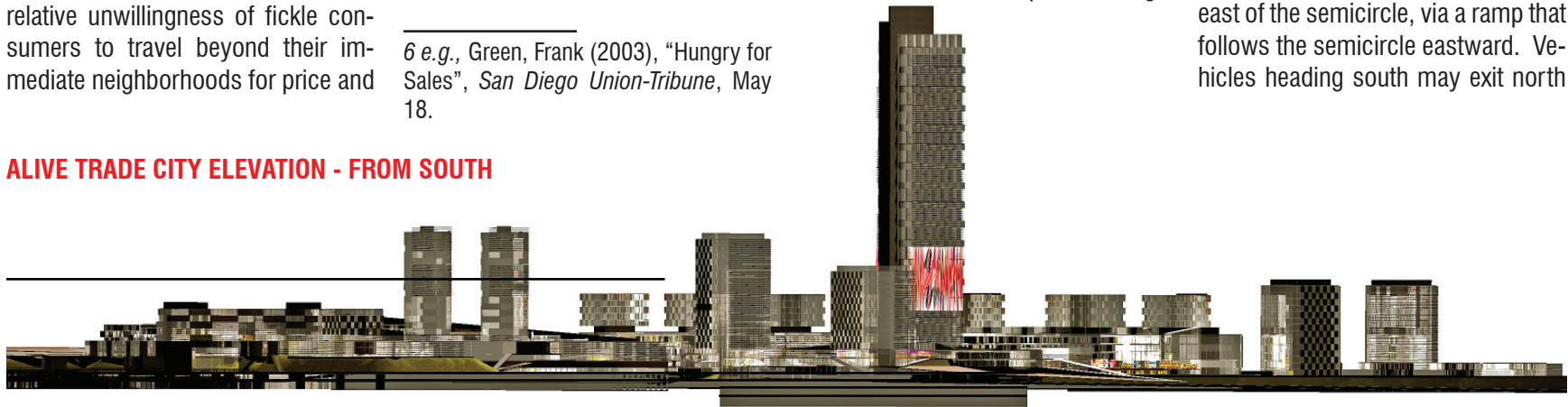
:CROSSING/POE

The Otay West crossing/POE is conceived as an integral part of the Alive commercial/retail circuit-- a progression of public spaces specialized to accommodate border-related retail activity, both as services to border crossers and as a draw to the area.

Vehicular traffic will pass through

the immigration and customs checkpoint underneath a semicircular POE plaza. The wall is interrupted at the crossing, with any water accumulated in it at that point piped over the depressed highway, in a culvert. Vehicles heading north will have the option of staying on SR-11 northbound or immediately looping off the highway into Alive or directly into a large underground parking structure east of the semicircle, via a ramp that follows the semicircle eastward. Vehicles heading south may exit north

ALIVE TRADE CITY ELEVATION - FROM SOUTH



Alive POE/crossing plaza/conference center

ALIVE TRADE CITY ELEVATION - FROM SOUTHEAST



inflex neighborhood

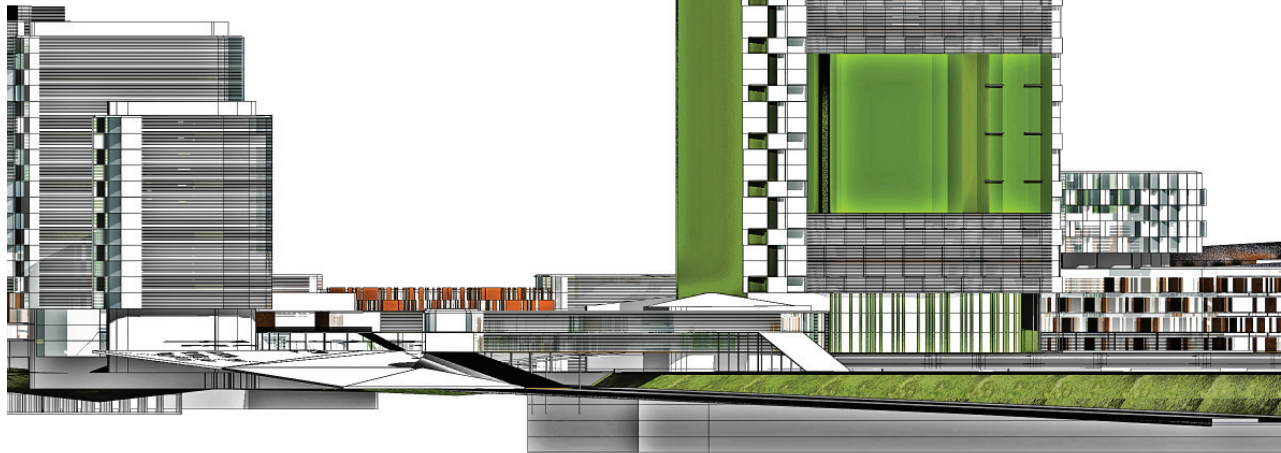
Alive trade city marketplace

MLOG neighborhood

Otay East truck/freight POE

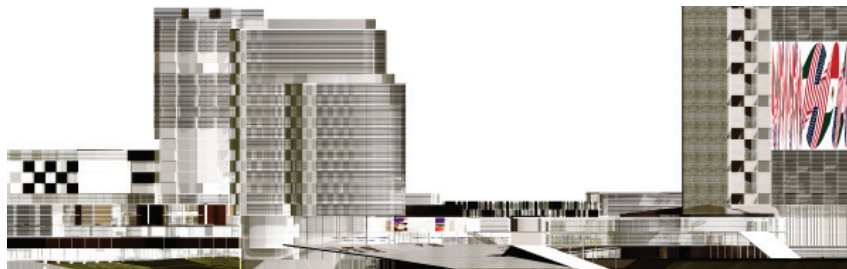
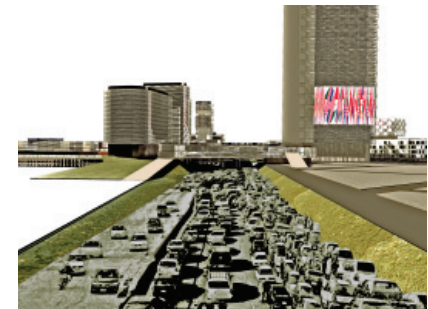
of the multimodal transit station (including to a large underground parking structure west of the highway, near the station).

Northbound pedestrians will avoid this level altogether, mounting ramps on either side of the highway up to the level of the plaza (orange coded route on the diagram on the next page). From there, they will pass



ter complex), along a People's Wall segment, to an outdoor market plaza that marks the beginning of the Alive Trade City retail circuit or (ii) continue at the customs level along the semi-circle until they reach a bridge which will take them to the multimodal bus/trolley station.

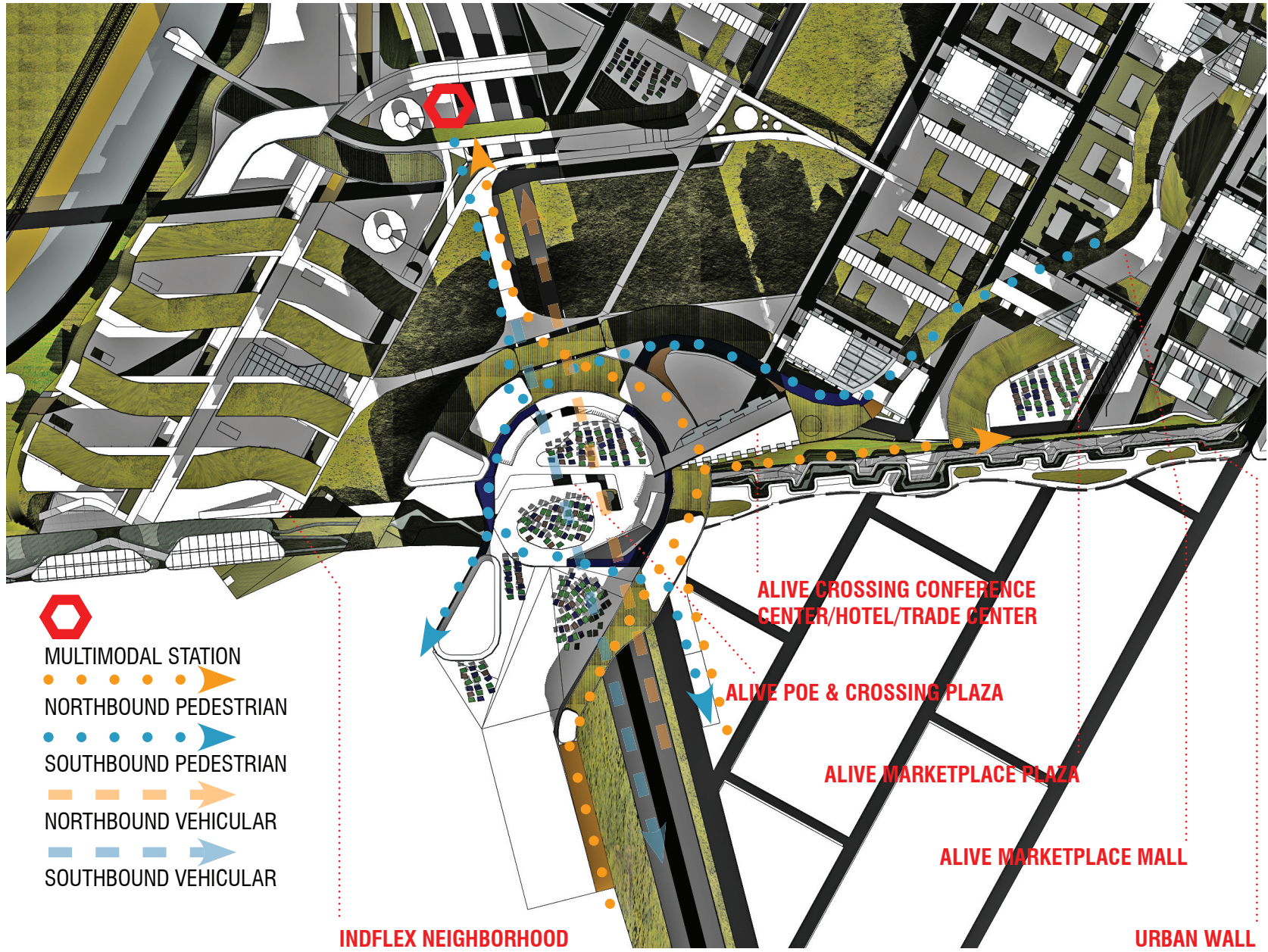
Southbound pedestrians may come either from the transit station, via ramp directly south into an upper floor of the semicircle (one level above the northbound side), or from



through a large semi-circular market area lined with stalls, food and retail establishments before proceeding to a customs hall located at the plaza level, on the east side of the semicircle. Following customs, they will proceed into the US one of two ways:-- (i) another ramp at the northeastern edge of the semicircle, which will take them down to an at-grade plaza (containing a hotel/conference cen-

the northeast (retail circuit) via the same system of plazas and ramps as the northbound pedestrians one level higher (blue coded route on the previous page). They will then proceed through Mexican immigration and customs on the upper level of the semicircle. From there, a ramp will allow them to enter the large retail plaza on the Mexican side.

ALIVE PORT OF ENTRY - TRADE CITY MARKETPLACE

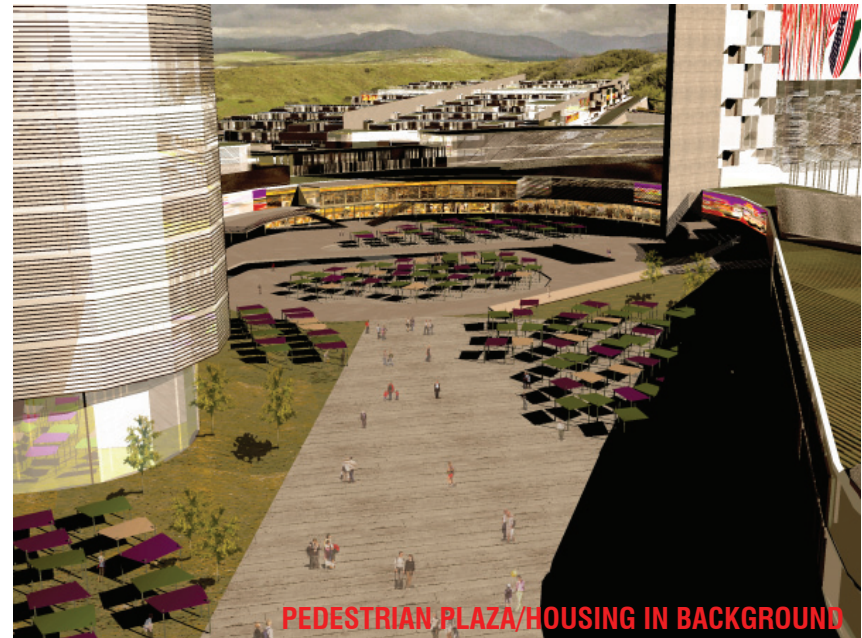


Drawings on this page illustrate the pedestrian approach from the south, looking north, (left) and a ground-level view of the semicircular plaza (below), looking northeast. The northbound customs hall is on the plaza level at the right of the drawing while the southbound customs hall is one floor above it.

US and Mexican administrative offices are located within the semicircle and in two small office towers, one on the Mexican side and one on the American side, which may contain

private border-oriented businesses as well. The two office buildings are both located west of the highway.

The larger tower shown is intended to suggest the concept of a catalyst conference center and hotel, particularly dedicated to the region's *maquiladoras* industry:-- a gathering place for trade shows, deal-making and business hospitality. The complex, which is shown here on the US side, may include a luxury hotel, transient occupancy apartments, convention center, meeting rooms, and perhaps



PEDESTRIAN PLAZA/HOUSING IN BACKGROUND



PEDESTRIAN PLAZA OVER POE/HIGHWAY

a short-lease office component.

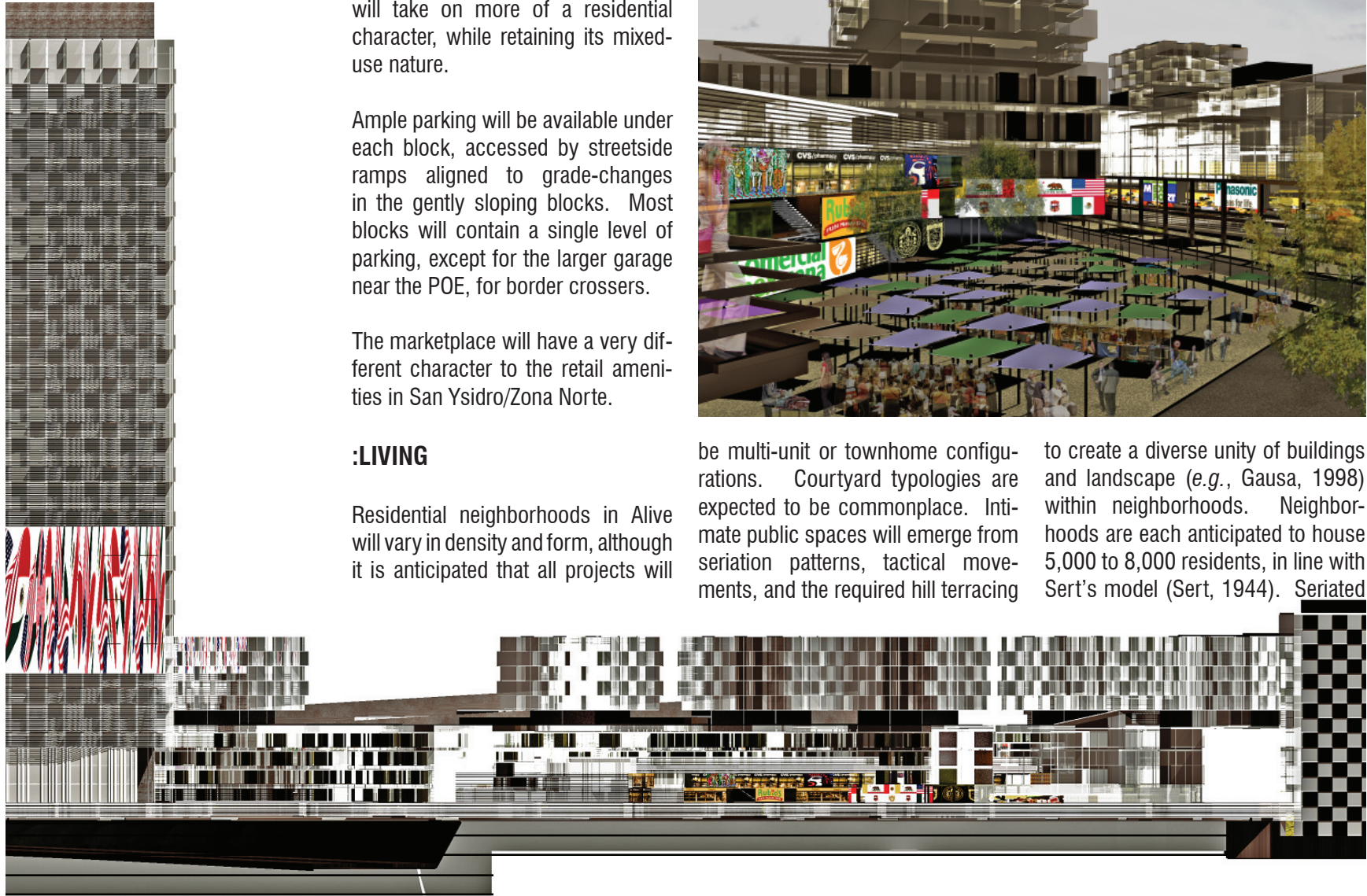
Two to four levels of underground parking on either side of the green frame will provide accommodations for 5,000 northbound cars and 26,000 southbound cars and buses.

:MARKETPLACE

The southern part of the Alive Trade City will comprise a retail circuit surrounded by commercial office estates and mixed-use housing. The People's Wall will comprise an

integral part of this neighborhood, providing, in its tree covered and canopied folds, a number of public venues for cafes and performance events. An open air market will face the wall.

A north-south outdoor pedestrian shopping center, perhaps programmed with a mixture of large outlet stores and smaller businesses, all catering to border crossers, would parallel the Trade City's primary north-south commercial street. Both corridors will culminate at the top of



the circuit in a commercial plaza.

The western edge of the Trade City will take on more of a residential character, while retaining its mixed-use nature.

Ample parking will be available under each block, accessed by streetside ramps aligned to grade-changes in the gently sloping blocks. Most blocks will contain a single level of parking, except for the larger garage near the POE, for border crossers.

The marketplace will have a very different character to the retail amenities in San Ysidro/Zona Norte.

:LIVING

Residential neighborhoods in Alive will vary in density and form, although it is anticipated that all projects will



be multi-unit or townhome configurations. Courtyard typologies are expected to be commonplace. Intimate public spaces will emerge from seriation patterns, tactical movements, and the required hill terracing

to create a diverse unity of buildings and landscape (e.g., Gausa, 1998) within neighborhoods. Neighborhoods are each anticipated to house 5,000 to 8,000 residents, in line with Sert's model (Sert, 1944). Seriated



SHOPPING MALL



NORTH-SOUTH COMMERCIAL STREET



PARKSIDE PROMENADE/GREEN FRAME



MAIN PLAZA AT NORTH LIMIT OF CIRCUIT

housing systems will be open, relying on non-elevator outdoor access, with building heights ranging from two to four stories, and complexes with mixed income, differentially sized units will be common.

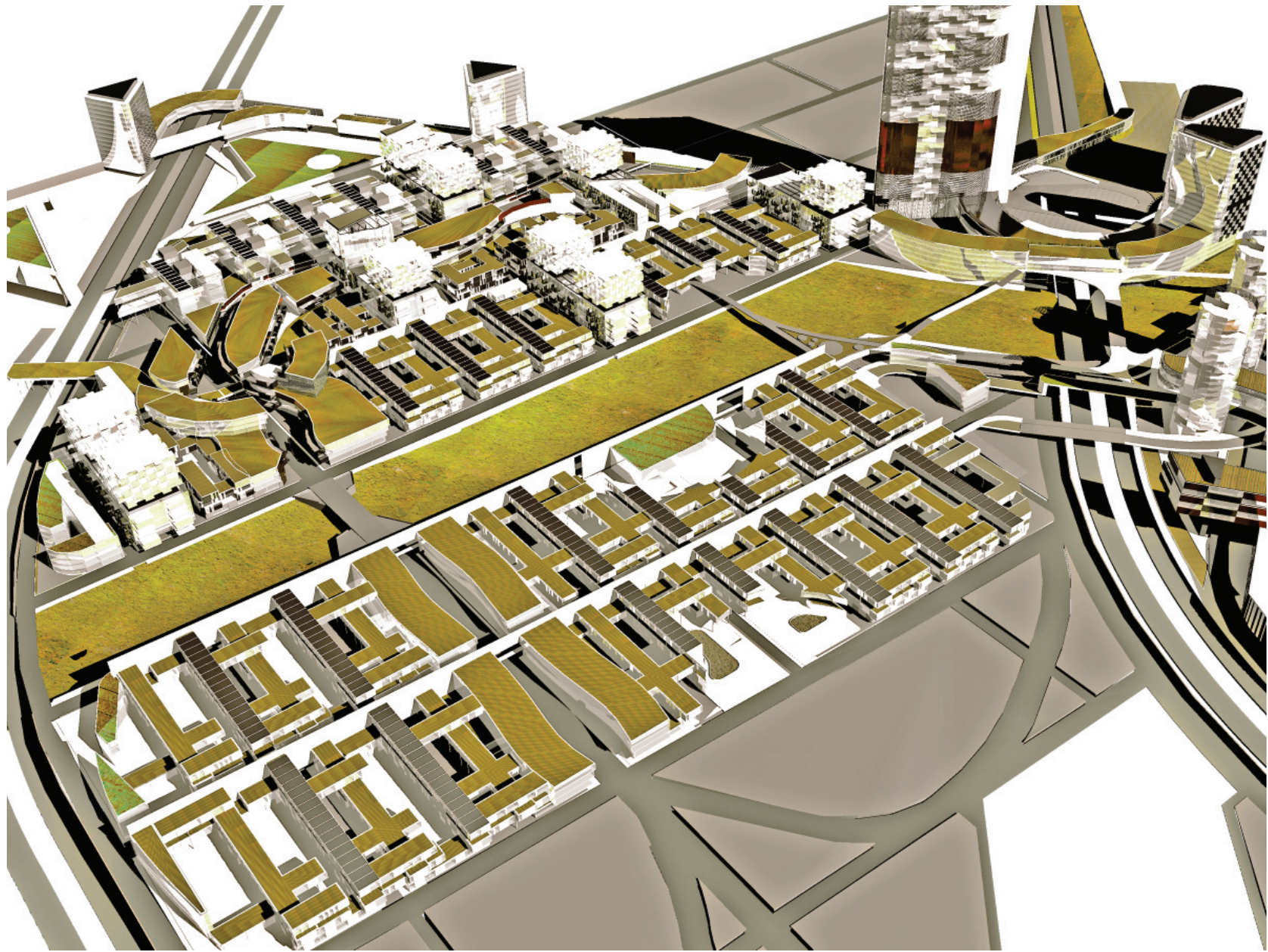
Convenience stores, on the Mexican model, will be inserted into residential fabrics. Supermarkets and neighborhood services will generally follow from a central avenue, although not continuously along it. The avenue will contain most institutional programs:-- churches, schools, creches and so forth. Housing units may be placed on top of or over these larger footprint programs.

INDFLEX

Indflex neighborhoods will vary substantially in composition and form, but generally they emphasize the development and redevelopment of large big-box tilt-up on steel frame buildings. Development principles will discourage demolition when programs change and, instead, will favor retrofitting and adaptation, and with a bias toward gradual densification.

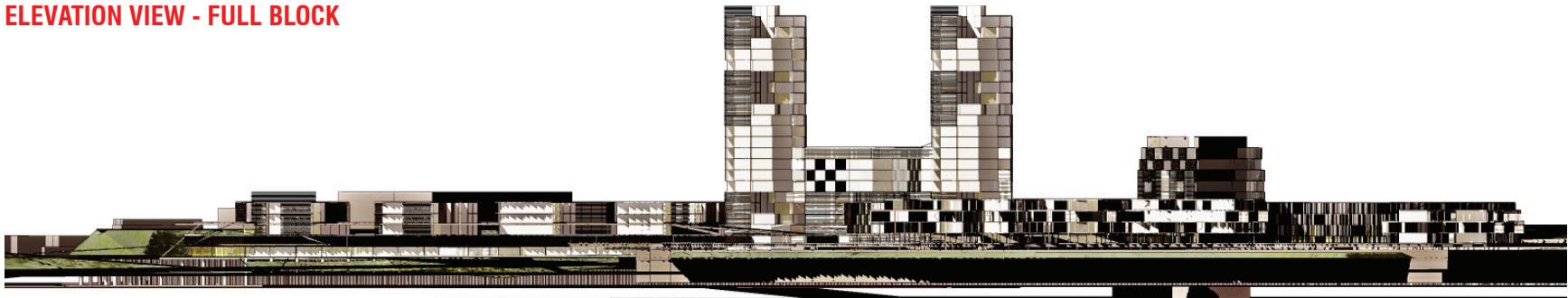
Boundary conditions are critical for Indflex fields where they adjoin the various infrastructure frames or





ALIVE RESIDENTIAL AREA & TRADE CITY

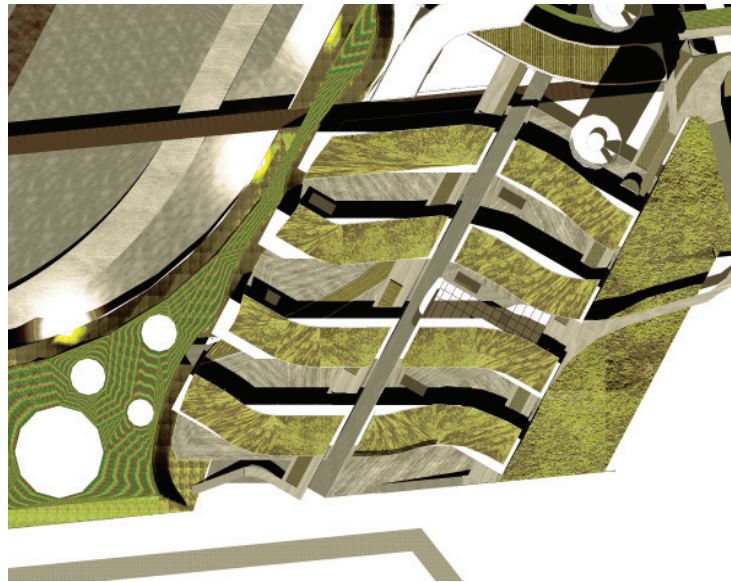
ELEVATION VIEW - FULL BLOCK



MLOG fields, and the use of landscape berms may be commonplace.

The Indflex neighborhood shown is an exceptionally dense and purpose-built (as opposed to redeveloped) one, opposite of the Otay East pedestrian/passenger POE and including a multimodal transit center. Big box stores are placed, at grade, over the vast POE parking structure, which the stores may share, and small apartment blocks placed over the stores. Residents cars park on the big-box roof, accessed via ramps.

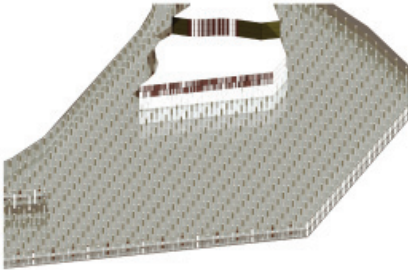
INDFLEX PLAN WITH HOUSING ATOP BIG-BOX



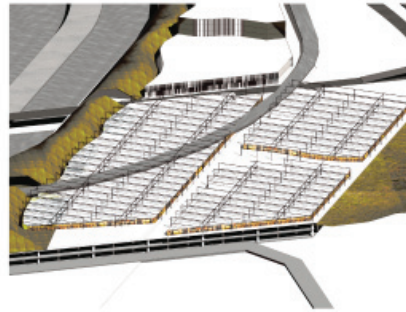
ELEVATION VIEW _ - CLOSE-UP



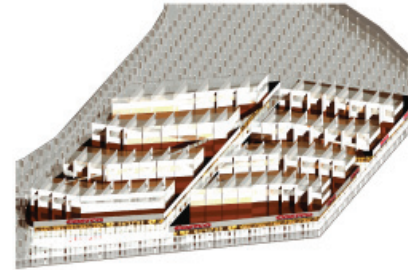
PARKING



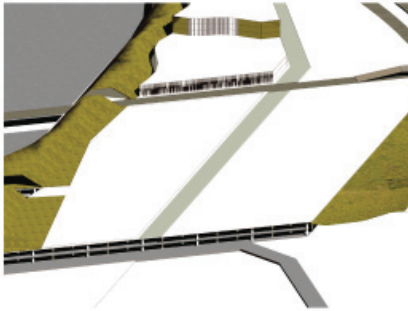
BIG BOX FLEX BUILDINGS



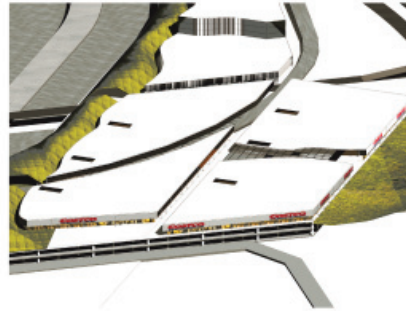
HOUSING



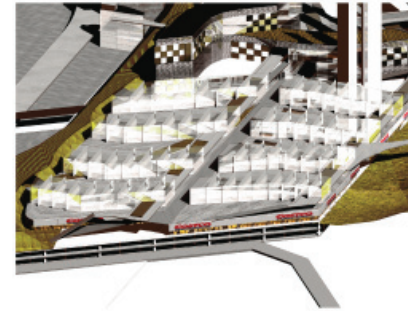
PARKING INSERTION



BUILDING STRUCTURE



HOUSING RELATION TO LOWER MASSES

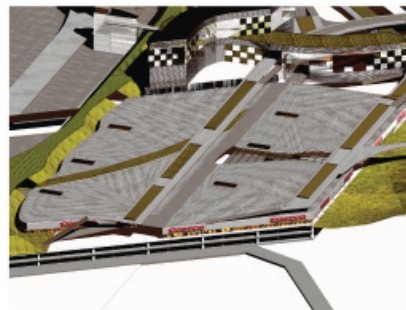


BLOCK & BERM SYSTEM

BUILDING FORM

HOUSING RELATION TO ROOF PLAZA

**HYBRID
BIG BOX FLEX
DEVELOPMENT
FIELD**



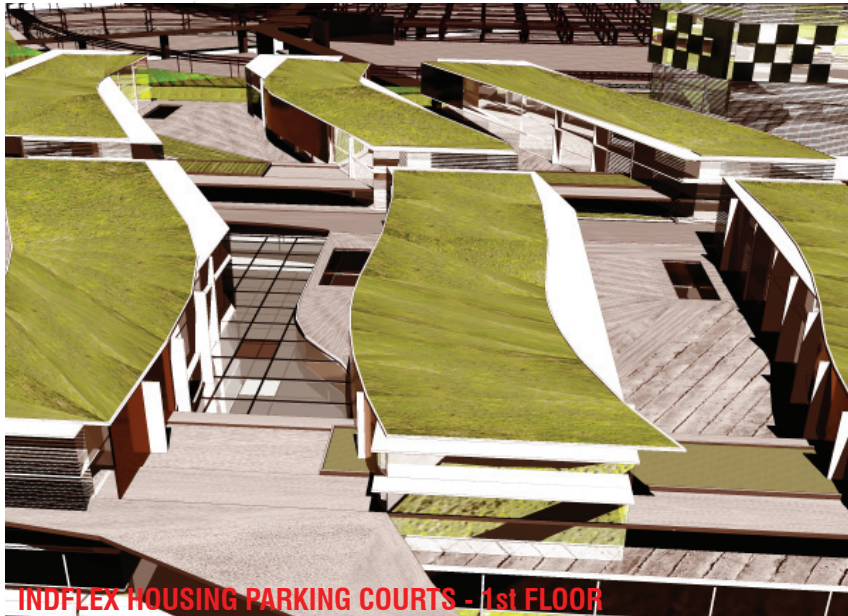
ROOF PLAZA/PLATFORM

INTEGRATION

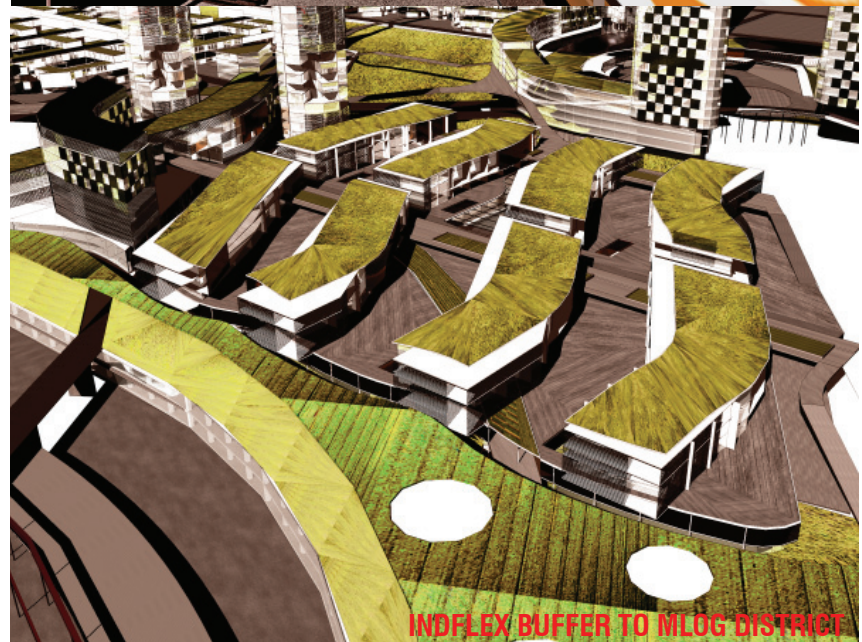
INDFLEX TYPOLOGY



INDFLEX AXON WITH HOUSING ATOP BIG-BOX



INDFLEX HOUSING PARKING COURTS - 1st FLOOR



INDFLEX BUFFER TO MLOG DISTRICT

Maas' (2005) densification concepts of "structure intensification" and "multi-flex use big boxes" provide guidance for the indflex transformations.

MLOG

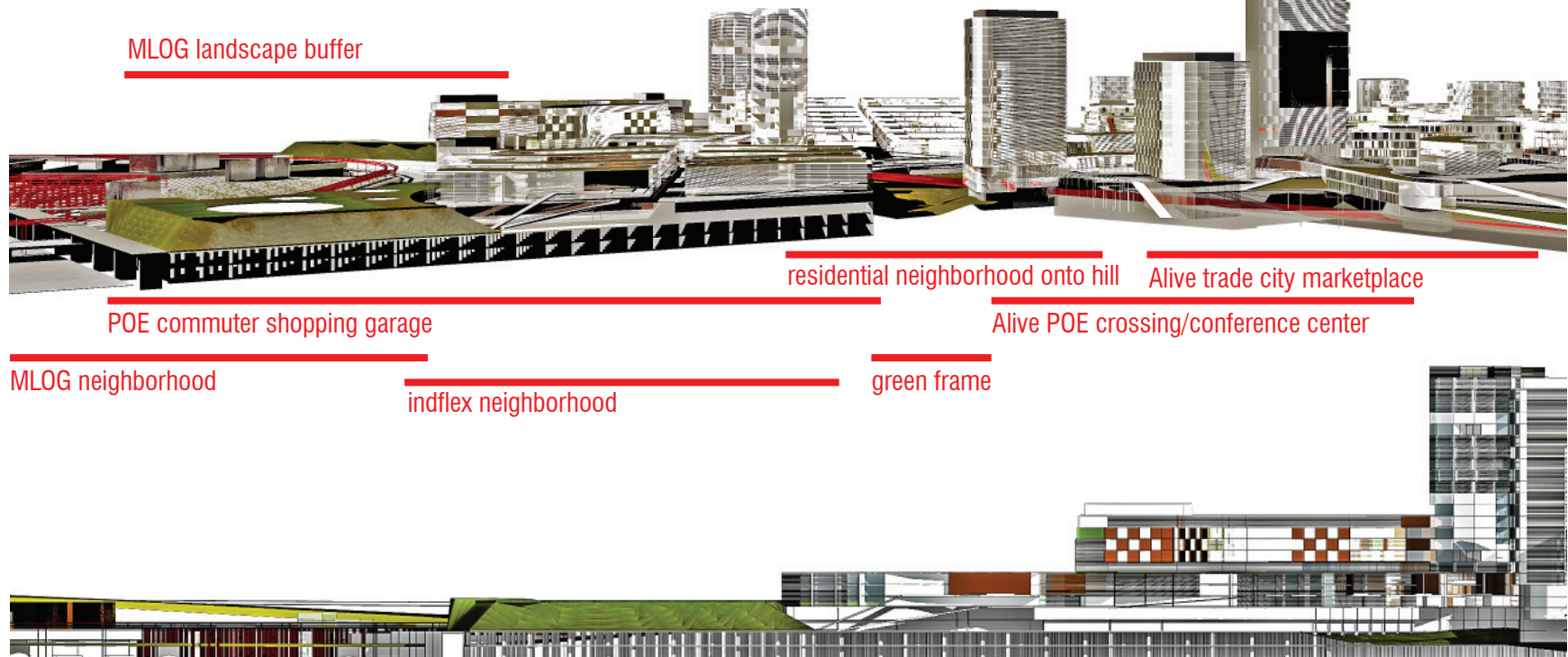
MLOG neighborhoods are intended to accommodate the highest intensity logistics and manufacturing, with an emphasis on the former, with efficient and container-oriented intermodal transportation access, and ex-

treme flexibility in building form and lot utilization. Each neighborhood will constitute an eco-industrial park, equipped with resource exchange facilities, environmental systems, water supply and recycling, and power, including, where practical, cogeneration. Adjoining Indflex fields may host supporting office space, R&D and services, for synergistic linkages, taking us a step closer to integration on advanced supply chains with knowledge/innovation chains (e.g., Erie, 2003).

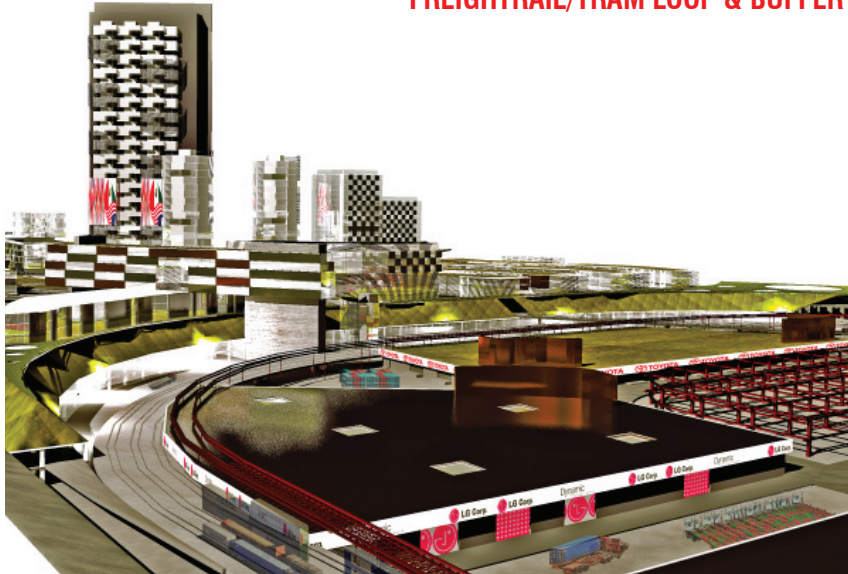
Advanced logistics facilities may be structured as freight villages (e.g., Ho, Karunakaran, 2005; UNESCAP, 2005; Weisbrod, 2005):-- minimum 100 hectare transloading and logistics centers with integrated program and one-stop shopping for clients:-- common user facilities, true multi-modal access and a full range of services, including onsite facilities for customs brokers/shipping and transfer agents and others, RFID tagging, freight security, container scanning and inspections capability, possibly

training and educational facilities and so forth.

As with Indflex fields, buffering, edge conditions and wastewater handling are critical.



**MLOG NEIGHBORHOOD WITH
FREIGHTRAIL/TRAM LOOP & BUFFER**



MLOG NEIGHBORHOOD VIEW TO LANDSCAPE BERM



MLOG NEIGHBORHOOD CONTAINER MANIFOLDS



MLOG NEIGHBORHOOD FLOOR LEVEL

**rePLACE/
reVOLUTION**

placemaking

reboot

revolution

PLACEMAKING

Most non-BIS architecture in Otay Mesa to date emerges from two sources: the BIS, or rather the requirement to work around it, and automobile-oriented suburban industrial and office planning prototypes first developed in the 1950s and 1960s. These prototypes stressed distance from the distractions of high intensity (and high density) urban life, in order to promote work efficiency, corporate security and commuter accessibility (Rowe, 1991), all based on principles of “informality and modernity.”

The vision plan, as proposed, seeks to deviate from this traditional mode of design, to produce environments which fuse, through interlacing and interaction, large-scale infrastructural and conservation systems with a range of programmatically appropriate and flexible urban fields. The nature of such field interactions was described by Dutch urbanist Jan Willem van Kuilenberg:

“We are living in an era of interlace. In our present society, life patterns have become increasingly dynamic: living, working and leisure are blended more and more. This requires a flexibility from everything and everybody that can be generated and powered by density, fu-

sion and parallelism. Density is bringing together functions in concentrated layouts. Fusion or interlace is the cooperation and/or merging of previously separated function. Parallelism is the availability of several functions at the same moment” (van Kuilenberg, 2006).

Among these fields will be urban moments -- concentrators of urban activity like the Alive Trade City -- designed using place criteria that “foster encounters, intimacy and collaborative contacts” (Thakara, 2004). These places will provide “hard and soft assets” for the region (ibid), and a site for positive and dynamic exchange between the city’s diverse communities. Programmatically, these concentrators are intended to be synergistically integrated with the industrial, logistics and border exchange activities unique to the site.

These urban concentrators will serve two functions. The first will be to reinforce and enable the projected role of Otay Mesa as a best-in-class center for production and logistics. Specifically, they will “concentrate” in space a range of offices, supporting business services, meeting/dealmaking space, space for industrial conventions and trade shows, research and development, education and training, and good housing

and related services. These concentrations will be strategically arrayed around the much larger tracts of land used to house workshops, warehouses, container yards, customs facilities and loading and transloading facilities.

In this sense, the vision plan’s design goals are similar to those seen in other innovative industrial new towns. For example, Alvar Aalto’s communities along the Finno-Russian border in the Vuoksi River Valley were designed in the 1930s and 1940s with the following objectives in mind: (i) avoidance of homogenous living and production zones; (ii) flexibility through provision of a deliberately loose grid; (iii) provision for “an ability to bind and hold together seemingly scattered elements” through the linkage of circulatory systems and landscape; (iv) simultaneous preservation of personal and family privacy and cultivation of a dynamic communal life; and (v) development of holistically integrated communities (Giedion, 1956).

These proposed concentrators are envisioned as places where work-related programs are not clustered and functionally segregated, but rather they are intended as multifunctional

“open source” work spaces whose uses can be dynamically adapted and generated by educated and empowered users (Thakara, 2004). They will be spaces for productivity, innovation and personal and enterprise development, where “life is no longer... subordinated to the working day; on the contrary, life is what infuses and dominates all production” (Hardt, Negri, 2000, 365).

The second function of the concentrators is to provide similarly dynamic “exchange space” (Thakara, 2004) for the other binational communities that rely on cross-border activities, for social and family purposes, recreation, shopping, culture, and general commerce. This exchange space will serve as *fora* for positive contact between diverse groups, including the advocates and members of all of the site’s constituencies. It will also serve as a competitive asset for the region, contributing what Thakara referred to as “territorial capital” (ibid). Through the urban design of appropriate spaces for public and private exchange, it is hoped that the proposed interventions will help direct the social, cultural and economic reconnection of the divided city.

King (2004, 92) argued that “con-

tinuing processes of hybridization take place at scales smaller than the city, not least, the suburb, block, apartment or individual dwelling.” The design of public interactional concentrators may provide spaces for what may be termed ‘creative hybridization’ that, in turn, may help to shape San Diego/Tijuana’s future.

REBOOT

Why should Otay Mesa’s urban design and planning matter when many of the important political and economic decisions concerning its future are being made by people far away, who are, in large measure, indifferent to that future? As a frontier security sector of the US Department of Homeland Security, in a time of endless war and fear, it will have its BIS and its high degree of militarization for the foreseeable future. As a production (as opposed to management or finance) node in the global trading system, it is subject to investment decisions based on universal issues of comparative advantage. But, ironically perhaps, it is precisely because so many aspects of its destiny are tied to the decisions of distal agents, that its physical form is so important. Only that physical form is under the control of local agents.

As discussed in the reCONTEXT chapter, geographical constraints make Otay Mesa the only urban interface between the US and Mexican sides of San Diego with real scale and development potential:-- San Ysidro only meets Zona Norte at a point, constrained on one side by the tidal wetlands of the Tijuana River Estuary and, on the other, by the *mesa* cliffs. Symbolically and physically, Otay Mesa either separates San Diego from Tijuana into a divided metropolis or forms a vital district of an integrated one. Local agents, working within the limits of the *mesa*’s topography and the environmental systems hosted by it, are responsible for developing, shaping and implementing a vision for its development that could go beyond the indifference of the BIS and globalization:-- if only they can agree on what that vision should be.

Preservation of US industrial jobs has long been a political objective for San Diego’s leaders. As described in the reCONTEXT chapter, the 1985 conference on Otay Mesa’s future concluded that low cost industrial land, effectively subsidized by overzoning, was the answer to increasingly competitive industrial development on the Mexican side. This logic was seen

again in the 2004 mayoral election, when pro-labor candidates argued that legislation was required to categorically prohibit the re-zoning of industrial land in San Diego to other uses. As a consequence, requests by the real estate industry and others in favor of mixed-use zoning were ignored, not out of a desire to protect residents from the negative effects of proximal industry, but out of concerns that allowing other uses to encroach on industrial zones would lead to property value increases (and hence drive away industrial employers). As a consequence, the exclusive nature of industrial zones was maintained in the General Plan Revision draft (City of San Diego, 2006) now under development (Jackson, 2004).

These policy decisions appear to be based on a fundamental misunderstanding of what San Diego needs to sustain and create manufacturing jobs. Despite these efforts and despite recent evidence that manufacturing output is at an all time high¹, San Diego has continued to lose industrial jobs (*e.g.*, Calbreath, 2007):-- manufacturing labor productivity growth has outstripped

¹ San Diego Regional Chamber of Commerce (2007), <http://www.sdchamber.org/visitor/econ.html>.

manufacturing sectoral growth. The future of industry in San Diego – and its comparative advantage relative to San Diego/Tijuana’s Mexican half -- relies on capital infrastructure, state of the art supply chains, international trade links, technology, and investment in education, and not on low paying jobs on cheap land (Feinberg, Schuck, 2001; Curry, 2000). Indeed, the presence of skilled and disciplined lower cost labor, in Tijuana, in such close physical proximity to capital and technology-based industry, in San Diego, is precisely why the manufacturing sector has continued to be successful in the city, and, indeed, in other US/Mexican border areas (Soden, 2004). For San Diego to capitalize on these advantages, trade infrastructure, of the type proposed in this vision plan, will have to be constructed, and Otay Mesa seems to be the most likely location for its situation (*e.g.*, Erie, 2003; Erie, Nathan, 2000).

Keith Pezzoli at the University of California San Diego articulated one vision for the *mesa*. He described three issues affecting planning and design decisions in Otay Mesa (Pezzoli, Marciano, Zaslavsky, 2001): (i) physical fragmentation of infrastructural systems, (ii) uneven economic

and physical development and (iii) uneven knowledge among stakeholders about the function of those systems. Not only do these issues affect industrial development, but they also result in a situation where industry threatens environmental systems. He recommended the use of design and planning strategies based on industrial ecology to mitigate these environmental concerns. In particular, he proposed the development of eco-industrial border parks, similar to those contemplated in this vision plan. Such parks would comprise communities “of cooperating industrial concerns that work together to achieve improvements in their environmental and economic performance” (Pezzoli, 2000). Members of eco-industrial park communities would coordinate exchange of energy, water, materials or even access to retrofitted or recyclable buildings. The physical park may be supplemented by a knowledge-sharing network, incorporating companies, educational institutions, thinktanks, local governments, and, perhaps even the security apparatus.

However, cultural and structural barriers have, to date, prevented the city from embracing such visions, or taking other aggressive development

and planning decisions at Otay Mesa of a nature necessary to secure the city’s long-term growth objectives (Feinberg, Schuck, 2001). San Diego has underinvested in trade infrastructure; allowed its concerns about security to prevent development of the required cross-border access systems; and permitted racism and perceived cultural differences to prevent the necessary commercial integration with Tijuana (ibid). As long as fear and division are present as memes in local and national decisionmaking, the future of the *mesa* will likely remain in contention.

Two recent developments make resolution of these conflicts an imperative for, at least, San Diego: (i) the US\$9 billion Punta Colonet megaport/new city proposal and (ii) a proposed relaxation by the US Federal government of the existing requirement that long-haul trucks from Mexico must transload their freight within 25-miles of the US border.

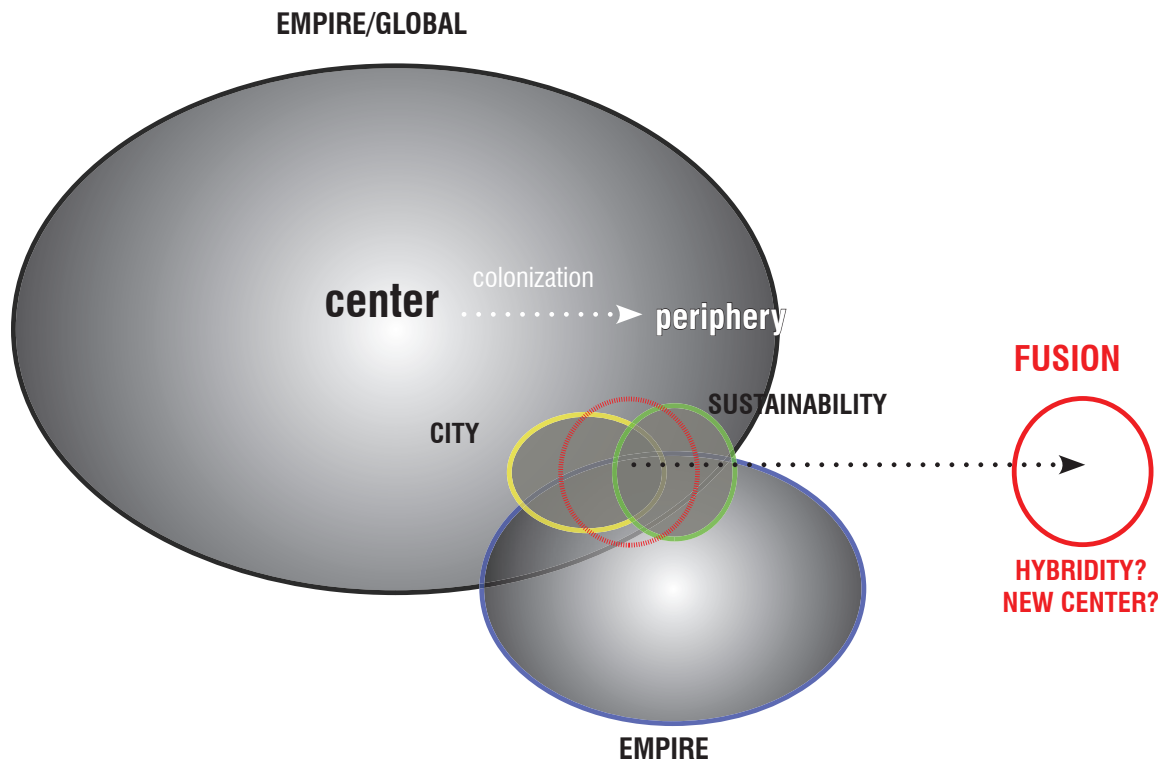
Punta Colonet is a sheltered deepwater harbor south of Tijuana chosen by the Mexican central government for the development of a new city, high capacity rail link and “megaport” for the entire region (e.g., Lindquist, 2007):-- the first of its kind outside

of East Asia and, exclusive of Dubai’s plans, the only new one proposed outside of that region. The “megaport” would comprise the western seaboard’s first facility with the capacity to accommodate new Asian superfreighters. More importantly for Otay Mesa, it will enable a minority of the containers now transloaded through Otay Mesa and bound for ocean shipping out of the San Pedro/Long Beach port complex near LA, to be sent to the new port instead, bypassing the *mesa*.

San Diego/Tijuana would, with the construction of Punta Colonet, become a viable production and logistics node in Pacific Asian supply chains, in a way no North American location has been able to achieve. In certain respects, Punta Colonet was anticipated by the recent announcement, cited in the rePROGRAM chapter, that the first of several major Chinese manufacturers will soon begin construction of large-scale capital-intensive plants in Tijuana. At present, most of San Diego/Tijuana’s markets are reached through overland segments, and there is relatively little intra-coastal traffic between west coast seaports. With the construction of Punta Colonet, this would all change.

The second development is a US Federal government proposal to eliminate a long-existing requirement for Mexican long-haul trucks to transload to American-flag freight transport systems within 25 miles of the border (Krawzak, 2007). With such a change, some haulers will be able to bypass Otay Mesa for destinations deeper in the US, eliminating the requirement for the *mesa* to serve as a transloading port. Under this scenario, Otay Mesa would remain a transloading facility for exports and imports into the region, on either side of the border, and a production area on its own right, but its importance as a transloading point for through-trade would be put into question.

The consequences of these changes for Otay Mesa are ambiguous, although, clearly designing for flexibility is best:-- off-*mesa* alternatives would open up for regional manufacturers, on the one hand, but, on the other, the total volume of economic activity would increase. But for San Diego, the implications may be more deleterious. With the combination of Punta Colonet, with its promise of superior infrastructure and easy access to both markets and shipping, and the removal of the transloading requirement, with its implications for



logistics facilities on the US side of the border, much of San Diego's industrial employment could eventually be at risk. Once Tijuana is endowed with relatively superior infrastructure, San Diego will become a prisoner of its own wall.

San Diego, at least, should therefore be strongly motivated to explore Otay Mesa's potential to improve connectivity with Tijuana. Tijuana's leaders, for their part, have generally advo-

cated mutually-beneficial infrastructure linking the two cities, but Tijuana also stands to gain from redevelopment of Otay Mesa as a venue for the activities of exchange. Separately, and perhaps more critically, an Otay Mesa equipped with the hard infrastructure of trade (both as proposed here, for the site, and in the context of existing and regional systems such as Punta Colonet) combined with the envisioned concentrators for interpersonal exchange, could be-

come a common ground for interaction between *Latino*, *Anglo* and other communities on either side of the border. In turn, such a common venue would provide the city with a more intangible type of soft infrastructure it presently lacks. As described by Thakara (2004), this soft infrastructure is critical for growth.

Such a new center, would, of its nature, help enable the city to transform its frontier status on a number of im-

perial and global peripheries into an asset. In turn, the city would become less peripheral and, perhaps, through processes of hybridization (see illustration on this page), become something of its own core.

Interestingly, residents of San Diego appear to have a good sense of what the border area could become, and what the city needs. An anonymous blogger, calling himself or herself fra59e presented a bold vision in response to the afore-cited article on Punta Colonet, on a *San Diego Union-Tribune* newsblog on August 16, 2007:--

"The people of San Diego County and Baja California Norte need to recognize that like it or not our futures are entwined.

Most international boundaries are natural, such as rivers. Ours is not natural. It is entirely artificial, a mere line on a map, fighting against nature. Had not the King of Spain arbitrarily assigned the colonization of Baja to the Jesuits and of Alta to the Franciscans, we would be one country or one State today.

Let a free trade zone be created, encompassing everything from San Onofre to Colonet. Within that zone allow free movement of capital and labor. Watch prosperity grow. Both ethnic groups will flourish and live better. Few Mexicans im-

will choose to move north when they have ample well-paying jobs in Baja. Many San Diegans will seize the new opportunities to invest in the growing new free trade economy.

All customs and immigration duties of the respective national governments will be transferred to the boundaries of this new free trade zone. Corky McMillin will develop housing in Rosarito. The extended trolley line will link Oceanside to Ensenada, making it easy for us all to travel to the new airport in Baja which will complement Lindbergh and Rodriguez. The new railroad from Colonet will carry freight to Otay and points north.

The new greater San Diego metropolis will develop its own identity, a significant city on the world stage, no longer threatened with lapsing into a mere “Riverside with surf,” suburb of Los Angeles.

The worst problem of San Diego politics is that our civic leaders lack large scale long term vision. Instead of trying to reassure our battered civic ego with pretentious and false claims of being America’s finest city we need to make it actually become so, the new Singapore of the Pacific Rim².”

2 The quoted text was an anonymous editorial blog entry by “fra59e” in response to a news article published in the *San Diego Union-Tribune* web edition. As of this writing, the blog entry may be found at <http://www.signonsandiego.com/news/mexico/20070816-9999-1b16colonet.html>.

If fra59e is right, the contradictions of the divided city can only be resolved by the reconstitution of the broader region as a city state, with a border around its periphery instead of bisecting its heart.

REVOLUTION

Hybridization is the theoretical construct underlying the abstract idea of an integrated San Diego/Tijuana region. Nezar Alsayyad, a scholar of this construct, defined “hybrid urbanism” as the “insertion of a third possibility connecting originally incommensurable terms and irreconcilable realities” with reference to cities where “incompatible” cultural terms and realities are brought together (Alsayyad, 2001, 2). Using the examples of San Diego/Tijuana and other cities around the world, Alsayyad defined such hybrid urban spaces as a new type of place which emerges “from a space where elements encounter and transform each other” (7), as opposed to places of cultural synthesis formed solely from merged or combined elements. To borrow a term from Nobel Laureate Homi Babha, this “third space”³

3 Homi Babha defined the “third space” as the “liminal” or “interstitial” space between competing cultural or historical traditions.

(used here to refer to the new multicultural urban places that emerge from hybridization) may, in turn, generate new cultural identities and foster new types of identity-based resistance and autonomy. Characteristics of people inhabiting this ‘third space’ may include: greater capacity for juggling cultures and coping with cultural contradictions; enhanced ability to resist structures of inequality imposed by outside oppressors; and the development of new ‘creole’ identities (Alsayyad, 2001).

Hybrid urbanism cannot, Alsayyad argued, be understood outside of everyday practices, in discrete urban spaces (2001). In his conception, there is no “world culture” and the apparent convergence between the urban cultural values of elites and others “may only reflect the self-representation of the dominant particular, and not a true integration of the ‘third space’ into a world system” (13). That “dominant particular” may be nothing more than the most powerful colonial influence. Instead, a genuine “third space” is a local construct. For example, if the *Anglo* and *Latino* cultures in San Diego/Tijuana hybridize, then a local or regional ‘third space’ emerges, influenced by but separate from the wider, homogenizing influ-

ence of globalization in general. This concept is, perhaps, similar to Arjun Appadurai’s argument that global or dominant cultural practices are transformed, indigenized and adapted to localities, and that hybridization is simply the outcome of this process of transformation, indigenization and adaptation (Appadurai, 1996).

This vision plan proposes a means through which planning and design may be used to create a place at Otay Mesa in which residents of San Diego/Tijuana may come together in the business of shaping, through the day-to-day activities of exchange, working and living, a hybrid multicultural city. New physical infrastructures and ecological systems, based on the latent outlines of existing site conditions, will frame a matrix of neighborhoods in which this agenda of growth, change and cultural fusion will occur. As Alsayyad concluded:

“All that can be hoped for at the beginning of the 21st century are environments that harbor the potential for growth and change and peoples who may find the possibility of adapting and adopting otherness as a legitimate form of self-identification” (Alsayyad, 2001, 16).

The physical form of such a future is, as of yet, unclear, but perhaps Otay Mesa is good place to start designing it.

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Documents and reports referenced in this writing and prepared by or for other governmental agencies are cited in the General References section, above. These “other” agencies participate in various aspects of the Otay Mesa planning process and include the Binational Watershed Advisory Council for the Tijuana River Watershed, various agencies of the state governments of California and Baja California Norte, the California Energy Commission, the US Department of Homeland Security, the US Environmental Protection Agency, the US Forest Service and the Mexican PROFEPA.

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appendices

proposed matrix programming dbase

precedents

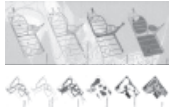
APPENDIX 1

PROPOSED MATRIX PROGRAMMING DBASE

Cluster	Use	New Programming	Old Programming	Status	Phase	District	Gross Hectares Leasable Square Meters				Dwellings					
							FAR	Land Area	Industrial	Retail	Office	Hospitality	State	Social	Housing	Hsg Units
Alive M T	Core	mixed-use commercial Mexico	informal housing	redev	1	M	3.50	8.44	-	35,464	44,330	-	-	591	153,204	1,702
Alive US T	Core	mixed-use commercial	none	new	1	E	4.50	13.44	-	84,661	136,062	-	-	1,209	240,920	2,008
Alive E1 R	Housing	residential	none	new	1	E	2.00	17.54	-	7,891	-	-	-	7,014	266,549	1,777
Alive E2 R	Housing	residential	none	new	2	E	2.00	61.71	-	18,513	-	-	-	12,342	957,761	6,385
Alive C1 R	Housing	residential	none	new	3	C	1.50	59.69	-	10,073	-	-	-	4,477	658,107	3,134
Alive C2 R	Housing	residential	none	new	4	C	1.50	51.69	-	8,722	-	-	-	3,876	569,843	2,714
Alive C3 A	Academic	academic	none	new	4	C	3.00	17.52	-	19,714	18,400	-	-	131,429	273,373	2,485
Alive E1 P	Recreation	community park	none	new	1	E	-	27.99	-	-	-	-	-	-	-	-
Alive E2 P	Recreation	community park	none	new	2	E	-	48.82	-	-	-	-	-	-	-	-
Alive C2 P	Recreation	community park	none	new	4	C	-	19.87	-	-	-	-	-	-	-	-
IndFlex E1	IndFlex	mixed-use light industrial	none	new	1	E	1.50	5.69	29,854	-	-	-	-	256	17,733	136
IndFlex E2	IndFlex	mixed-use light industrial	none	new	2	E	1.00	27.56	53,747	-	-	-	-	551	67,142	448
IndFlex C1	IndFlex	mixed-use light industrial	none	new	2	C	1.00	43.88	85,566	-	-	-	-	878	106,892	713
IndFlex C2	IndFlex	mixed-use light industrial	customs/logistics/retail	redev	3	C	1.00	91.77	178,942	-	-	-	-	2,753	222,897	1,486
IndFlex W1	IndFlex	mixed-use light industrial	light industrial/agricultural	redev	3	W	1.00	152.04	296,483	-	-	-	-	3,041	370,376	1,852
IndFlex W2	IndFlex	mixed-use light industrial	yonkes/Brown Field	redev	3	W	1.00	72.37	141,126	-	-	-	-	1,447	176,299	881
IndFlex W3	IndFlex	mixed-use light industrial	Brown Field	redev	3	W	1.00	27.04	52,724	-	-	-	-	541	65,864	329
IndFlex W4	IndFlex	mixed-use light industrial	light industrial/agricultural	redev	4	W	0.70	178.85	244,128	-	-	-	-	3,756	304,096	1,520
MLOG E1	MLOG	medium-heavy logistics/industrial	none	new	1	E	0.60	39.14	70,448	-	-	-	-	-	-	-
MLOG C1	MLOG	medium-heavy logistics/industrial	industrial/logistics	redev	1	C	0.60	74.75	134,550	-	-	-	-	-	-	-
MLOG C2	MLOG	medium-heavy logistics/industrial	industrial/logistics	redev	1	C	0.60	123.37	222,058	-	-	-	-	-	-	-
MLOG W1	MLOG	medium-heavy logistics/industrial	light industrial/agricultural	redev	2	W	0.60	75.47	135,846	-	-	-	-	-	-	-
MLOG C3	MLOG	medium-heavy logistics/industrial	industrial/logistics	redev	2	C	0.60	71.59	128,864	-	-	-	-	-	-	-
MLOG E2	MLOG	medium-heavy logistics/industrial	none	new	2	E	0.60	28.13	50,638	-	-	-	-	-	-	-
MLOG W2	MLOG	medium-heavy logistics/industrial	light industrial/academic	redev	3	W	0.60	73.69	132,648	-	-	-	-	-	-	-
MLOG W3	MLOG	medium-heavy logistics/industrial	Brown Field/Yonkes	redev	3	W	0.60	111.85	201,330	-	-	-	-	-	-	-
MLOG W4	MLOG	medium-heavy logistics/industrial	Brown Field/Yonkes	redev	3	W	0.60	86.80	156,239	-	-	-	-	-	-	-
MLOG C4	MLOG	medium-heavy logistics/industrial	Yonkes/medium industrial	redev	4	C	0.60	106.20	191,164	-	-	-	-	-	-	-
Crossing E1	Border	truck/freight customs/emissions control	none	new	1	E	0.80	5.34	-	-	-	-	42,705	-	-	-
Crossing M1	Border	truck/freight customs Mexico	informal housing	redev	1	M	0.20	1.50	-	-	-	-	3,000	-	-	-
Crossing E2	Border/Hospitality	car/pedestrian customs/trade center	none	new	1	E	15.00	1.31	-	13,707	22,029	88,115	29,372	-	-	-
Crossing M2	Border/Hospitality	car/pedestrian customs	informal housing	redev	1	M	4.00	2.64	-	14,784	31,680	23,760	10,560	-	-	-
Crossing M3	Border	all customs/intermodal transloading Mexico	customs/logistics	redev	3	M	0.60	26.77	-	24,095	6,024	-	120,477	-	-	-
Crossing C1	Border	all customs/mixed-use commercial	customs/logistics	redev	3	C	1.00	12.93	-	19,394	9,697	-	90,505	-	-	-
Crossing C2	Border	freight conveyor/intermodal transloading	medium industrial/logistics	redev	1	C	0.70	8.50	-	-	4,463	-	53,550	-	-	-
Crossing W	Border	air passenger/airfreight/intermodal transloading	light industrial/agricultural	redev	3	W	0.70	12.00	-	6,300	6,300	-	67,200	-	-	-
Crossing C3	Border	central truck through-logistics/customs center	light industrial	redev	3	C	0.60	32.24	-	-	14,510	-	174,115	-	-	-
Resource E1	Resource	water reservoir park	none	new	1	E	0.50	8.00	-	-	-	-	40,000	-	-	-
Resource E2	Resource	water swale/pre-treatment/resource transfer park	none	new	1	E	0.20	9.48	-	-	1,422	-	17,065	-	-	-
Resource C1	Resource	water swale/pre-treatment/resource transfer park	light industrial/agricultural	redev	1	C	0.20	11.84	-	-	1,777	-	21,319	-	-	-
Resource W1	Resource	water tertiary treatment/reservoir park	light industrial	redev	2	W	0.50	7.90	-	-	-	-	39,481	-	-	-
Resource W2	Resource	water swale/pre-treatment/resource transfer park	none	new	2	W	0.10	7.43	-	-	557	-	6,686	-	-	-
Wall G1	Resource	wall/wetland frame	wall/exclusion zone	redev	1	G	-	11.48	-	-	-	-	-	-	-	-
Mesa G2	Conservation	Mesa conservation frame	some agricultural	new	0	G	-	1,148.55	-	-	-	-	-	-	-	-
Canyon G3	Conservation	canyon preserve	canyon preserve	new	0	G	-	1,694.06	-	-	-	-	-	-	-	-
TOTALS								4,718.85	2,506,356	263,319	297,249	111,875	716,034	174,162	4,451,056	27,570

INFRASTRUCTURE URBANISM PRECEDENTS

APPENDIX 2 PRECEDENTS



MAAS/MVRDV '05 -
PARKFORUM EINDHOVEN
- NL '03



deGEYTER '02 - AFTER
SPRAWL - NL '02



FIOI-SILVA '89 - NJ



GAUSA/ACTAR '03 - EL-
EMENTAL HSG SYSTEM
- MADRID '03



LYNCH '74 TEMPORARY
PARADISE - SAN DIEGO/
TIJUANA



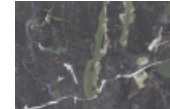
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LAND-USE



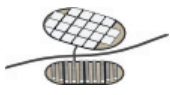
ALLEN '96 - ZAL
BARCELONA - SPAIN



MONOLAB '06 - RZG
ARCHIPELAGO - NL



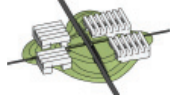
D'HOOGHE/ROMANOS '06
- TERRITORIAL INFRA-
STRUCTURE - NJ



infrastructure-
bounded development fields



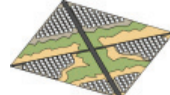
strategic "moves"
of development fields



development fields as
landscape urbanism



protected
fields of erasure



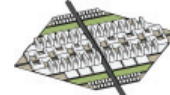
landscape bounded
island fields



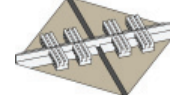
'new urbanist'
nodal fields



infrastructure
insertion into fields



development fields as
fine-grained micro zones

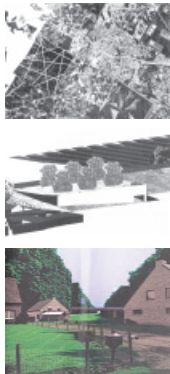


merging of field &
infrastructure

MAAS/MVRDV '05 -
PARKFORUM EINDHOVEN
- NL '03



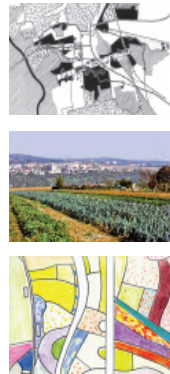
deGEYTER '02 - AFTER
SPRAWL - NL '02



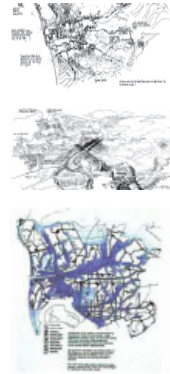
GAUSA/ACTAR '03 - EL-
EMENTAL HSG SYSTEM
- MADRID '03



KOOLHAAS '98 - VILLE
NOUVELLE MELUN-
SENART - FRANCE '87



LYNCH '74 TEMPORARY
PARADISE/SANTOS '96
GRAND DESIGN - TD/TJ



CALTHORPE '93 - SD
LAND-USE/CASA FAMIL-
IAR '03 URBAN VILLAGE



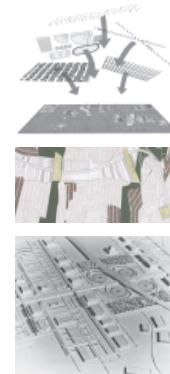
ALLEN '96 - ZAL
BARCELONA - SPAIN



MONOLAB '06 - RZG
ARCHIPELAGO/MAAS '05
BOXTEL - NL

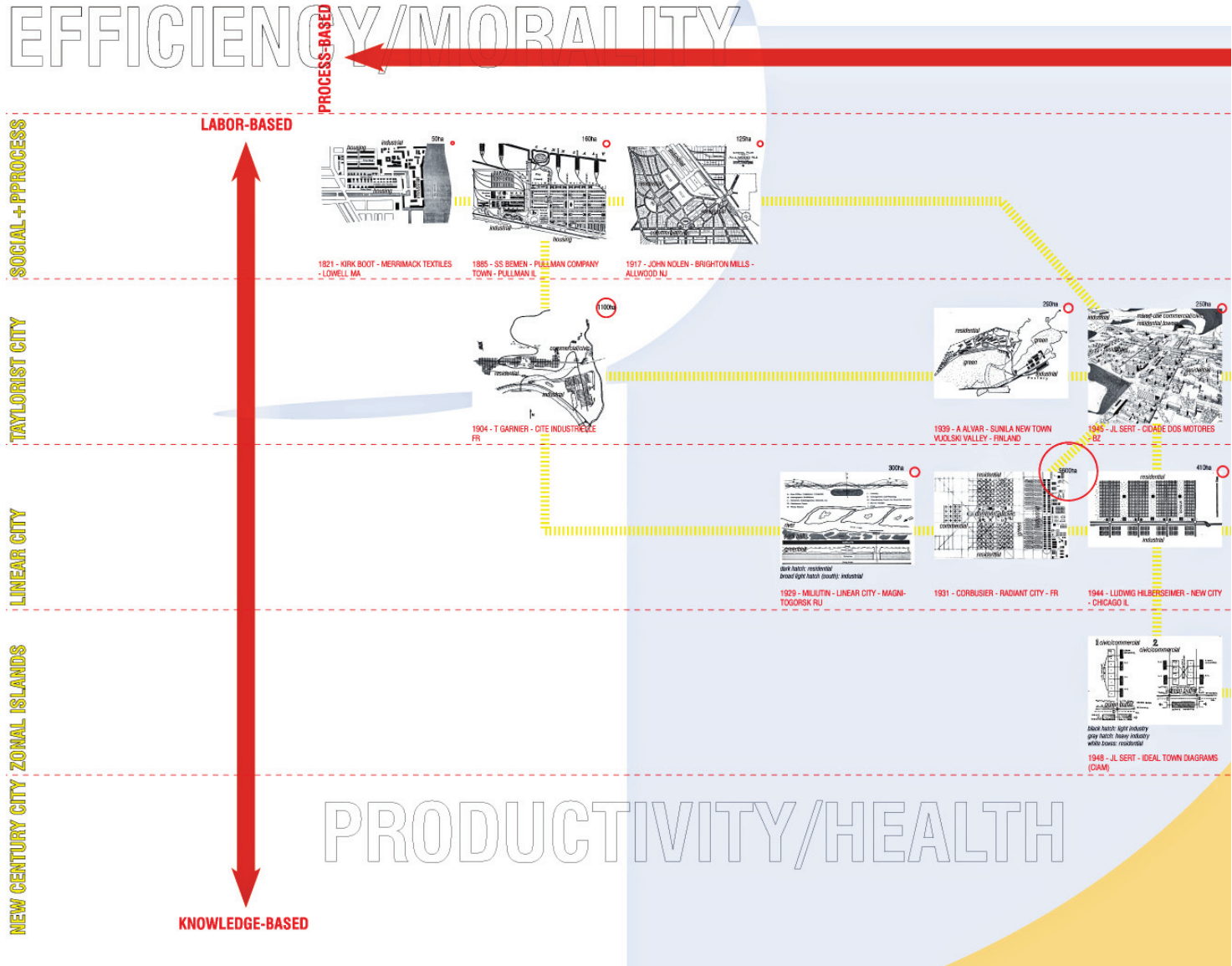


D'HOOGHE '06 - TERRI-
TORIAL INFRA / FIOI-SILVA
'89 TURNPIKE - NJ



**APPENDIX 2
PRECEDENTS**

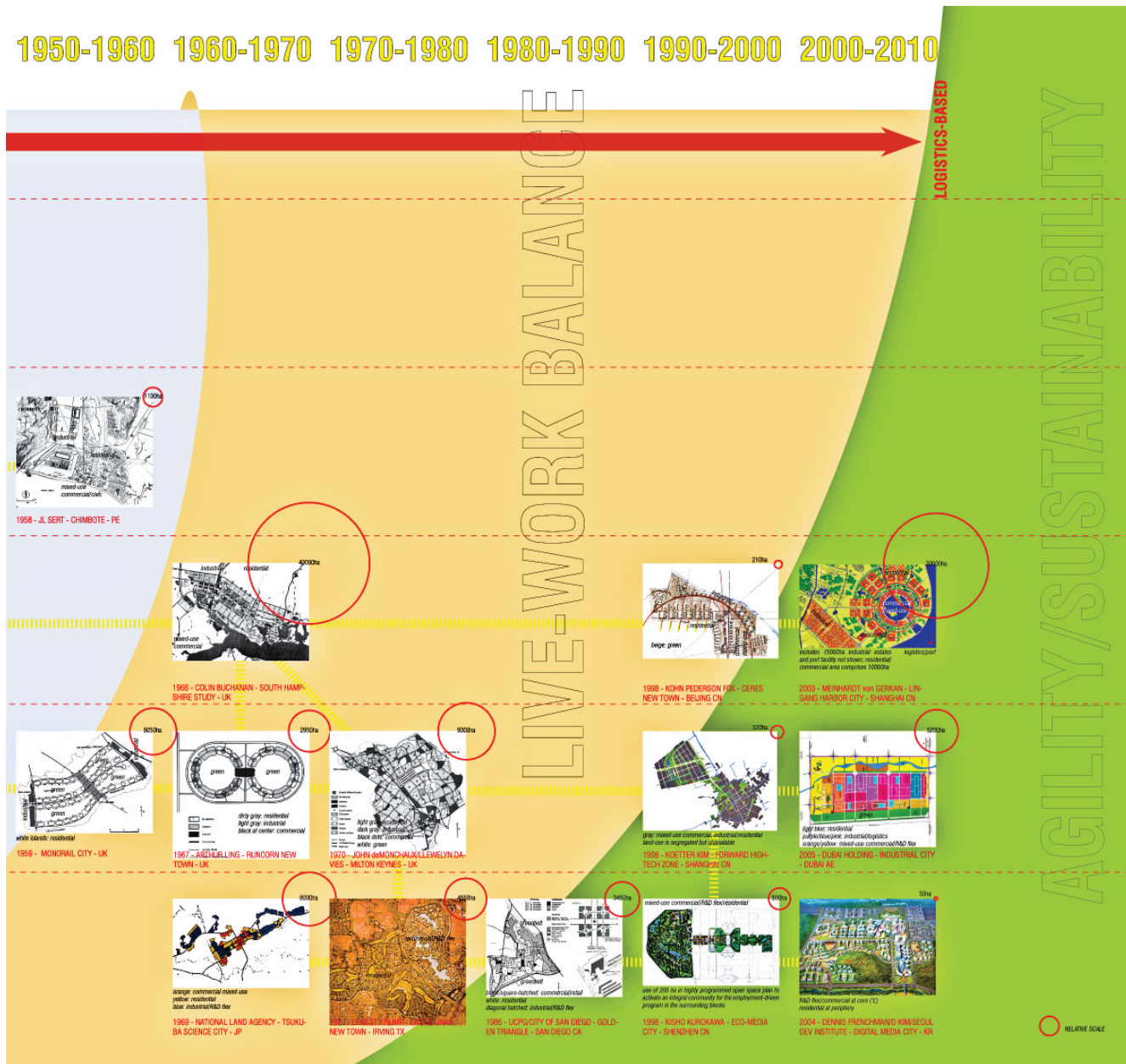
EARLY 19th LATE 19th 1900-1920 1920-1930 1930-1940 1940-1950



**INDUSTRIAL
NEW TOWN
TYPOLOGIES**

**APPENDIX 2
PRECEDENTS**

1950-1960 1960-1970 1970-1980 1980-1990 1990-2000 2000-2010



**INDUSTRIAL
NEW TOWN
TYPOLOGIES**

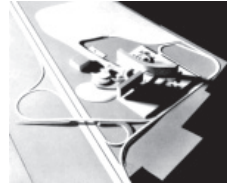
**APPENDIX 2
PRECEDENTS**

**FACTORY
DESIGN**

INDUSTRIAL SOLUTIONS



1915 - MATTE TRUCCO - FIAT FACTORY - TURIN IT



1962 - CORBUSIER - CENTRO DE CALCULO OLIVETTI - MILAN IT



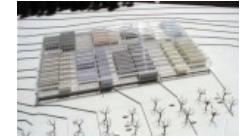
1970/1976 - JOHN DINKELOO - UC HQ/ RICHARDSON VICKS - CT



1989 - KATHRYN GUSTAFSON - SHELL PETROLEUM HQ - RUEIL-MALMAISON FR



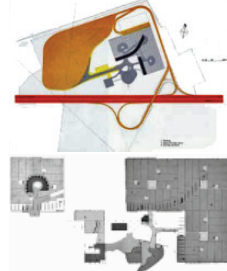
circa 1995 - JURONG TOWN CORPORATION - RAMPUP/STACKUP FACTORIES - SG



2005 - BAUART - SUNFACTORY - TRAMELAN CH



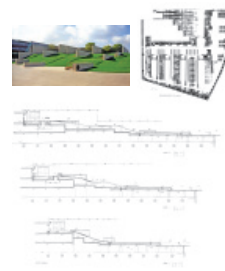
factory-infra integration/flexi reuse



vertical program integration



landscape integration



deceptive form/concealment

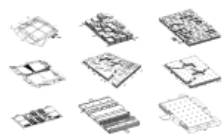


vertical supply/log chain

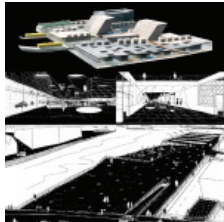


sustainable shell/envelope

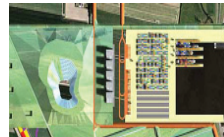
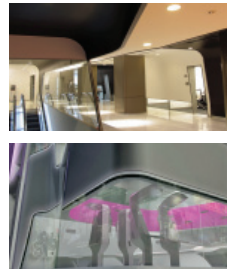
**INDUSTRIAL
FORMS**



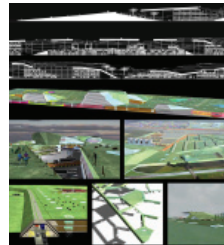
1993/2006 - MONOLAB - EURO-PAN 3 DORDRECHT/BUS BRAIN PARK STUDIES - NL



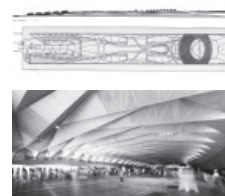
1998 - NEIL DENARI - MULTI-SECTION OFFICE BLOCK - LOS ANGELES CA



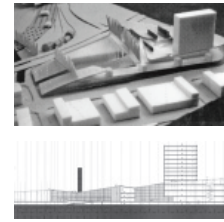
1999/2003 - MONOLAB - BREDA SANDS INFRASTRUCTURE/SHIPPING VALLEY - NL



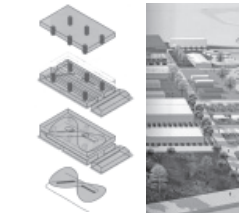
2002 - FOREIGN OFFICE ARCHITECTS - INT'L PORT TERMINAL - YOKOHAMA JP



2002 HELENA NJIRIC - BAUMAX - MARIBOR SI



2005 - MVRDV - CHAOYANG FACTORY PARK - BEIJING CN

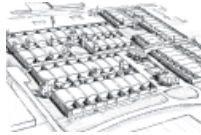


HOUSING SOLUTIONS

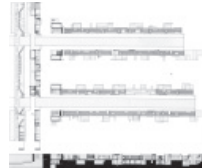
HOUSING SYSTEMS



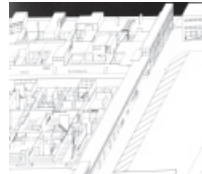
1950/1958 - JL SERT - BOGOTA PRECAST HSG/CHIMBOTE HSG - COLOMBIA/PERU



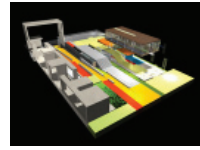
courtyard
seriation



1980 - REM KOOLHAAS - BLOCK 4 - BERLIN DE



inward
turned
forms



2002/2004 - TEDDY CRUZ - LIVING RMS AT THE BORDER/ SR HSG - SAN DIEGO CA



inward
turned



2003 - MEINHARDT von GERKAN - HOUSING LINGANG NEW CITY - SHANGHAI CN



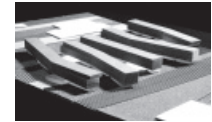
serial
geometry



2006 - HYBRIDseattle - VARIOUS CONTAINER PROJECTS - US



modular
systems

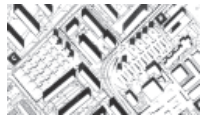


1996 - ACTAR - MIXED RESIDENTIAL MECHANISM - GRAZ AT

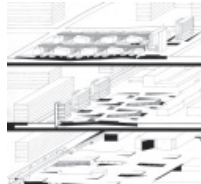


landscape
access

HOUSING HYBRIDS



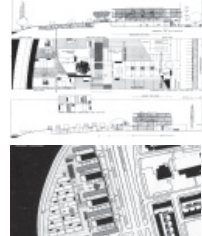
1993 - ALEXIOS DALLAS et al - HOUSING GROUP RENOVATION - MYERIN CH



formal
layering/
diversity



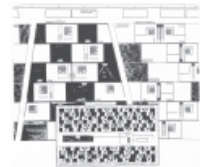
1993 - HELENA & HRVOJE NJIRIC - STRUCTURAL DIKE - DEN BOSCH NL



fine-grained
horizontal
mixed-use



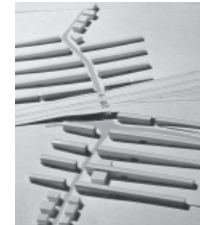
1998 - THIERRY ROAGNA et al - COMPACTURB BLOCK - YVERDON CH



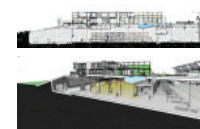
programmatic
layering/
diversity



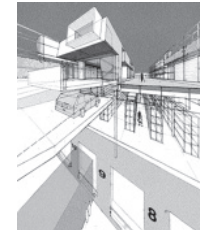
1998 - ELLEN MONJEN/AGNES BURG - BAHNHOFSTRASSE PROJECT - BERLIN DE



landscape &
infrastructure
integration



2004 - LTL ARCHITECTS - NEW SUBURBANISM - US



housing-
logistics
integration



2005 - MXG ARCHITECTES - WAREHOUSE CONVERSION EUROPA 8 - MARIBOR SI



adaptive
reuse of
industrial space

APPENDIX 2 PRECEDENTS

