Columbia University Graduate School of Architecture, Planning and Preservation
Fall 2015

Michael Bell, Professor of Architecture
With Yaohua Wang, Associate in Architecture

Abstract Engineering
BART + Tesla and City of Fremont

Near Infrastructural Architecture: A collaborative studio in conjunction with partners at Stanford University and Tongji University.

With support from Tesla Motors.

Our studio will focus on planned but not yet fulfilled extensions of the Bay Area Rapid Transit System (BART) that will link the South Bay to Silicon Valley.

Near Infrastructural Architecture: Our studio will focus on the future of infrastructure as an instrument of the public investment but also increasingly of architectural design. This studio is the fourth in a series that has sought to hybridize infrastructure and architecture and to extend the public economics of infrastructure and bring this to architecture and to architectural programming. The studio will seek to leverage the public nature of infrastructure as a development means for architecture and its wider social values. Our work will also look at ways in which the normative practice or real-estate in housing development can be supplanted by realizing architecture and its goals within infrastructural projects.

BART + Tesla and Fremont: Our studio site is in Fremont, California and the programming will focus on a planned, but as yet not designed new Fremont area Bay Area Rapid Transit (BART) station as well as a currently in construction station that is the seed for a new region of the city's development. The new BART stations and the anticipated development includes two zones adjacent to the Tesla manufacturing plant in Fremont and our studio will seek crossovers where architecture, infrastructure and new energy systems intersect. The extension of BART links the wider Bay Area and the South Bay in particular to Silicon Valley in important new ways and has the potential to alter housing affordability, commuting times/distances and the overall environmental planning in the region.

Post Redevelopment Agencies: In the aftermath of the 2008 financial crisis California ended the decade's long state level Redevelopment Agency apparatus that had been the revenue source for hundreds of urban redevelopment projects in the state and notably in a core of Silicon Valley—the city of San Jose. The Redevelopment Agencies were able to retain as local a higher level of sales and property taxes as an economic means to urbanize suburban cities. Going forward state mandates in California and in many states seek to link future development to transportation revenues and thus increase urbanization near or at public transportation access. Our studio, while based in California, has a wider mandate to place architectural design as a driver of development in this nexus by fusing infrastructure, housing, and overall regional

planning in ways alter the normal equation of the state funding infrastructure and real estate (often subsidized by the state) driving construction and development. Broad in scope we will nonetheless bring the work down to a precise architectural level.
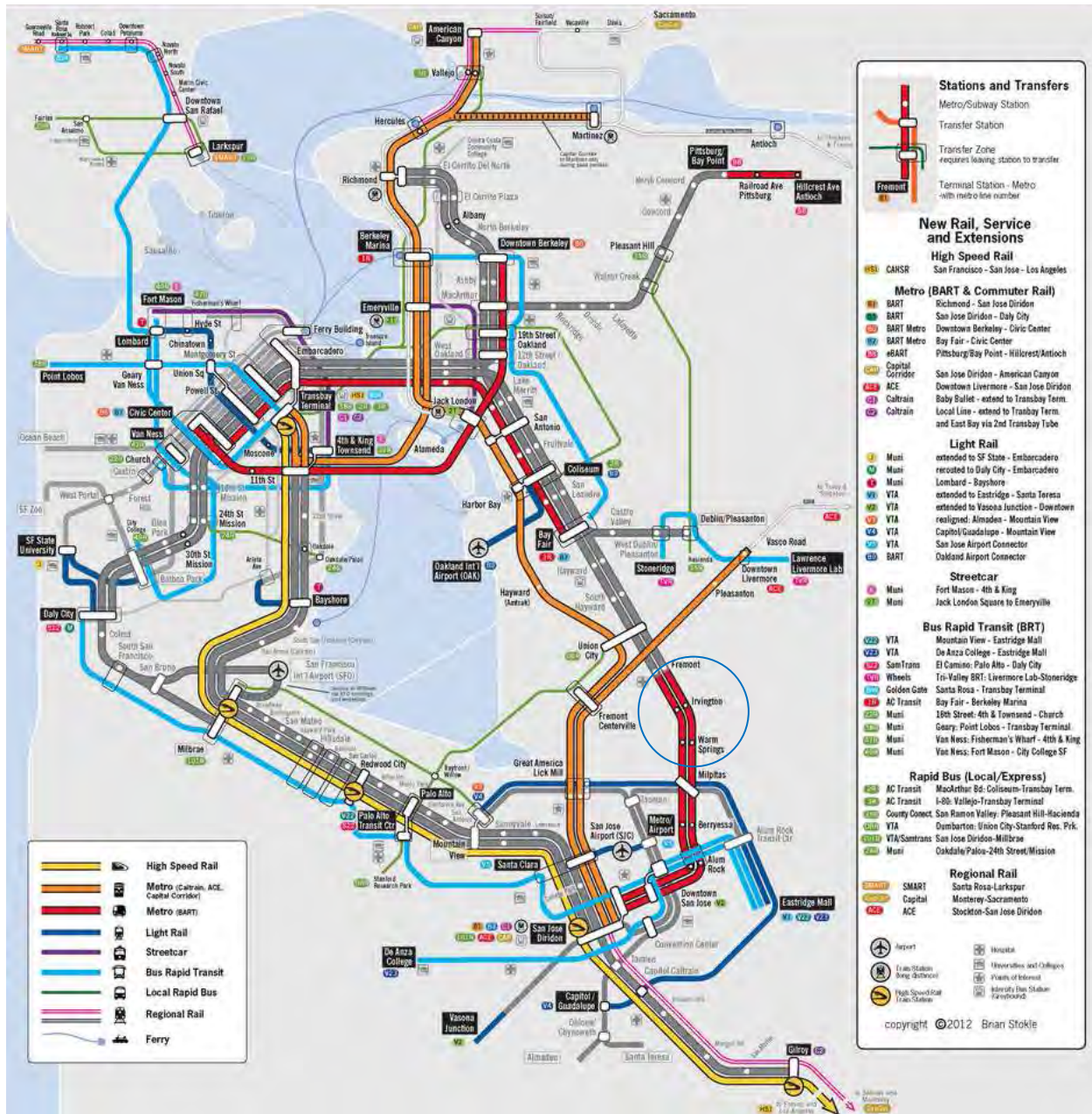
BART system map: Current and planned Stations. The blue circle shows these locations. Tesla Motors is immediately adjacent to the Warm Springs station.

Fremont and San Jose BART: Fremont is currently the final destination on the South Bay BART line but construction is currently underway that extends the system to San Jose. Our work will be sited in ways that require study of the entire BART system but also the South Bay region and its relationship to Silicon Valley. The two stations we will focus on are the proposed Irvington Station and the currently under construction Warm Springs Station.
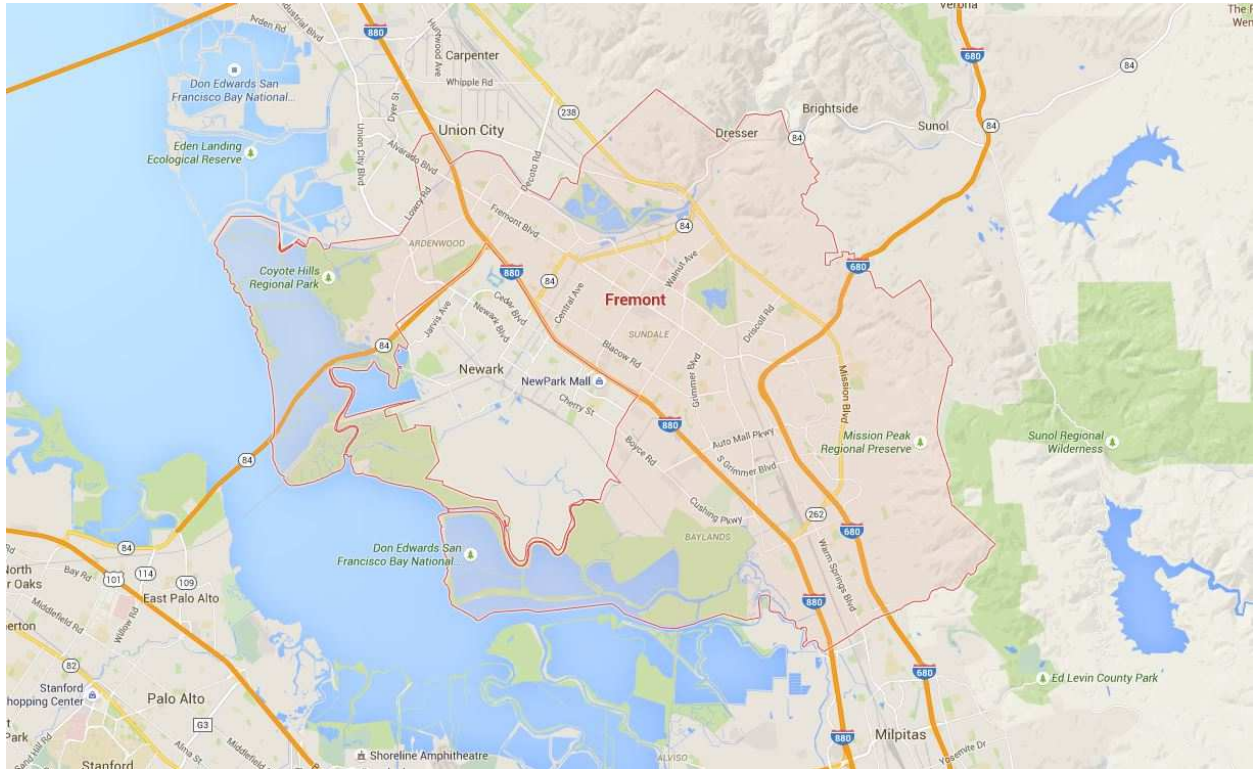
Fremont, California: Like many cities Fremont was incorporated as the merger of several smaller cities. The city of 225,000 people has a long history of industrial innovation. The future BART transit line and stations would effectively link it directly by public transit to Oakland to the north and San Jose and Silicon Valley to the south. Forming a virtual ring around the entire bay the new transit helps fuse the entire Bay Area and spectrum of its industries from software to manufacturing; from computers to automobiles. It also encapsulates the major universities and air and future high speed rail.

BART Extension:
http://www.spur.org/blog/2014-12-19/what-we-need-get-right-vtas-bart-extension-silicon-valley

Tesla Motors: Tesla Motors engineer Michael Pilliod will join our studio while in Fremont and Palo Alto. Tesla engineers have helped form our context for work. Tesla is located immediately adjacent to one of our sites and we will coordinate with Tesla on planning goals and technologies—that is, how does the presence of Tesla affect the planning for a new BART Station. Michael Pilliod, of Tesla, was formerly a lead engineer at Apple and his work as a materials engineer will help shape our research. Michael Bell has lectured at Tesla and joined their engineering team for discussion on materials and potential relationships between transportation and architecture and while in the Bay Area we will meet with Tesla engineers and designers.


Studio Travel: The studio will travel to Palo Alto, San Jose and Fremont, California between October 6th and 10th. The Warm Springs BART Station, shown in the circle above, is the hub for a new urban development that bridges the residential area east of the Tesla factory and to the industrial corridor of which Tesla is central.

Columbia Conference with Tongji and Stanford: On October 7th and 8th we will hold workshops and meetings with our partners from Stanford and Tongji. The "summit" will be held at Stanford University and is guided by GSAPP, Stanford and Tongji faculty and hosted at the Center for Design Research within the School of Engineering. Our partners at Stanford are doing focused research on future demands on infrastructure and in particular the emerging new potentials in the Bay Area where technologies developed in the Valley are increasingly affecting future planning. The summit will bring in key voices from the region to discuss future urban development and the BART extension.

The studio sites are shown in this Google Map:

https://www.google.com/maps/d/edit?mid=zMf5IlQGsnAY.kjkn_bf_qmDk&usp=sharing
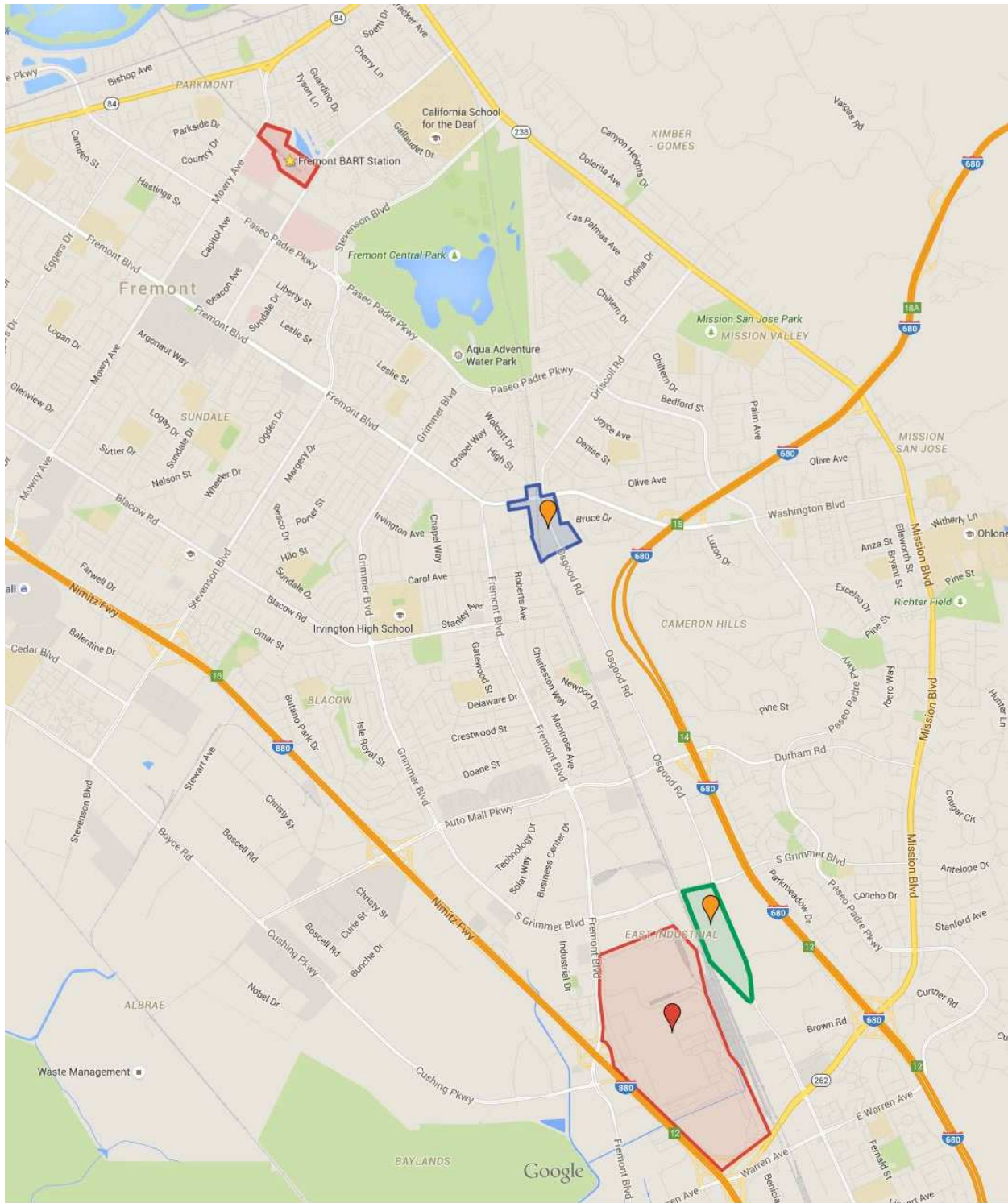
Station to Station: Our studio will take the three Fremont Stations and their urban implications as the basis for our design work. The central station (Irvington is not yet funded).

Fremont spans from the marsh lands of the San Francisco Bay to the arid mountains to the east.

Collaborating Schools and Partners: The studio program and goals have been developed in shared research and discussions with the following partners.

Columbia University, New York, Graduate School of Architecture, Planning and Preservation
> Michael Bell, Professor of Architecture
> Yaohua Wang, studio assistant

Stanford University, Palo Alto, the Center for Design Research
https://me.stanford.edu/research/labs-and-centers/center-design-research
> Chris Ford, Architect/Engineer: Research on future demands on infrastructure
> Larry Leifer, Professor, Mechanical Engineering Design Group, Stanford University
> Founding Director, Center for Design Research, Stanford University

Tongji University, Shanghai, China, School of Architecture
> Yung Ho Chang, Professor (Yung Ho Chang is also professor at MIT School of Architecture)
> http://www.pritzkerprize.com/about/jury-bios<o:p></o:p>
> https://architecture.mit.edu/faculty/yung-ho-chang
> Zheng Tan, Professor

Tesla Motors, Palo Alto, Fremont, Hawthorne, California
> Michael Pilliod, Engineer, Materials Science
> http://patents.justia.com/inventor/michael-k-pilliod<o:p></o:p>>

> http://www.patentlyapple.com/patently-apple/2013/02/apple-patents-reveal-nano-silica-fiber-coatings-for-macs-idevices-and-future-iphone-with-hearing-aid-detection.h

Studio Critics:

Michael Bell is a Professor of Architecture at Columbia University and chairs the Columbia Conference on Architecture, Engineering and Materials. Bell's design work has been exhibited at the Museum of Modern Art, New York; The Venice Biennale; The Yale School of Architecture; The University Art Museum, Berkeley; and at Arci-Lab, France. Bell has received four Progressive Architecture Awards, and work is also included in the collection of the San Francisco Museum of Modern Art. Books by Bell include Engineered Transparency; Solid States, Post Ductility (all volumes on the Columbia Conference on Architecture, Engineering and Materials); as well as 16 Houses: Designing the Public's Private House, Michael Bell: Space Replaces Us: Essays and Projects on the City, and Slow Space. Bell has taught at Berkeley, Rice, Michigan and Harvard. His 2008 Binocular House is included Kenneth Frampton's American Masterwork Houses.
www.Bell-seong.com
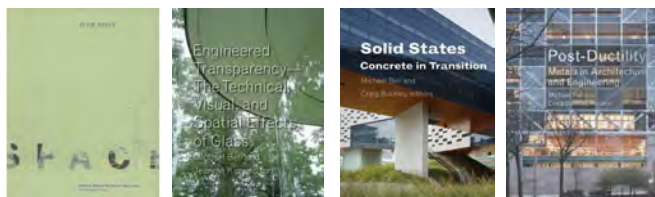
Yaohua Wang is Teaching Associate at The Columbia University Graduate School of Architecture, Planning, and Preservation and acted as final review critic in Harvard GSD, Columbia GSAPP, RISD and SCI-Arc. Yaohua received his Master of Architecture Degree with distinction from Harvard University Graduate School of Design. His final project was awarded the James Templeton Kelley Thesis Prize for best graduating project. He also holds a bachelor degree of architecture from Southern California Institute of Architecture (SCI-Arc), where he was awarded Best Thesis Award.
http://www.p--r--o.com/story/

Cupertino, California: As Apple undertakes a new corporate campus of infrastructural scale what are the parallel implications for areas of Cupertino adjacent to the campus? Is there a compensatory vision for architectural work in the program of housing, retail, government and public spaces? Drone Video: Apple Campus 2, Cupertino, Ca. Fall 2014. The campus dwarfs it neighbors but also will be relatively un-seen from outside the property's perimeter. At several billion dollars it is also a relatively small expenditure in the scale of Apple's financial means. Its fuses infrastructure and architecture in ways that are moderated by high levels of engineering and aggregate talent and coordinated resources.

The Corporate Campus: The Valley Architecture matures: the urbanism lags behind and relies on automobiles and a low-density form of development. Apple's new campus, futuristic in scope and material engineering hosts a 10,000 car parking garage as testimony to the Bay Area's lack of public transit.

The studio will not view Tesla or Fremont in isolation. This is the fourth studio run by Michael Bell exploring the increasing urbanization and rise of deep investment in architectural campuses in the Bay Area. The studios have focused on how cities struggle to compete and provide the same level of innovation and experimentation that private companies are increasingly providing in the Bay Area. How do new seemingly infrastructural works of architectural such the new Apple campus impact the overall urbanization of the relatively small host cities that form Silicon Valley.

The Case of Apple's campus is a provision for a space of design – not manufacturing. The Tesla site linked directly to BART offers a different scenario for its engagement with the wider network of cities but it is also a manufacturing plant.

SITE

The Image of the factory and its borders: This is our work: In the Future the city will be art.

Fremont is home to the engineering and manufacturing plant for Tesla and its role in producing electrically powered cars is well known.

Fremont is also the host city of the first extension of the Bay Area Rapid Transit system (BART) since the subway was founded in 1957.

While the Tesla plant is itself not a new construction – it was the former General Motors plant and then a partnership between GM and Toyota -- the recreation of the plant by Tesla as a visionary new production facility for a new automobile is. In Fremont one finds a formidable story that is both old and new at once: the private car meets mass transit here in a vivid new way but also the car and its entire process of design, engineering and more so material knowledge is reconceived and invented. In this same context the mass transit station seems stalled—even as it promises a new linkage and all the economies of public transportation it does not offer a great new urban vision.

In the history of manufacturing, factories of all kinds, we have seen historical examples of visionary works of architecture. We have also seen similar investment in the capacity of worker housing and urbanism that is parallel to and commensurate with the new factories. But here in the city of Fremont Tesla is largely behind its own walls at work on a *brilliant* new car.

Once completed the new BART stations will link Tesla to the center of Oakland, San Francisco, Berkeley and to further east cities such as Walnut Creek (and your single family home). Tesla has founded two new energy companies—focused on home energy storage and generation—as well as new mass transit (HyperLoop). With material and manufacturing innovations are we newly able to project a reorganization and spatialization of the factory and its surrounding city.

Studio Structure: the On Ramp….

The studio will initially follow three prompts or vectors; instigations of creative work that bridge science, technology and art.

While the three prompts are independent they also rely on each other.

At issue is a desire to invoke the technological prowess of Bay Area technology companies in creating new solutions to the wider urban development crisis that the maturing Bay Area is facing.

Our work will bridge a concern for technology and its interpretations (Abstract Engineering).

We will simultaneously review housing development mechanisms and spatial qualities that are long seen as endemic to architecture and to contemporary housing development and urban planning but that are here cast as restorative or invoked as reactive means to the prevailing technological prowess of the private sector.

The broader theme—Near-Infrastructural Architecture—is outlined in the addendum as a series of ways in which architecture defines a relationship to infrastructure.

A: Abstract Engineering: Interpreting Technology

In the 1948 Second Edition of "Fundamentals of Electric Waves" the author Hugh Hildreth Skilling, Ph.D. opens his book with a direct powerful distinction. Skilling was a professor of electrical engineering at Stanford University and in preparing what was intended as a text book he nonetheless stated that the First Edition of his book had been made the subject somewhat of a luxury. His work on electromagnetic theory he felt had in the First Edition seemed like a luxury. The approach to the subject had in the intervening eight years become less of a luxury as electrical engineers had in that period of time applied the ideas to "wartime" and that the ideas were essentially shown deeply valuable. Skilling work— a luxury and at times a seeming abstraction had become essential.
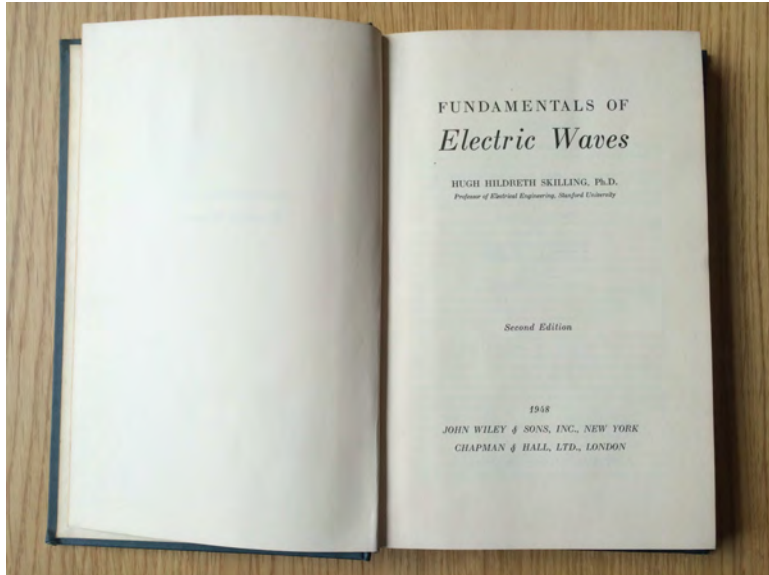
"Fundamentals of Electric Waves", however, was written for students who did not have prior experience in the subject and according to Skilling only required a general knowledge of college mathematics and physics. You could approach this subject without being an engineer and more so you could, with Skilling's assistance, delve quite deeply with the fundaments of a college level science education.

In preparing a studio that looks at the city of Fremont, California and in particular at how the city's prominent new industrial constituent, electric automobile manufacturer, Tesla Motors, may affect the future planning of the city, Professor Skilling's book and its opening chapter are a remarkable un-intended guide and mentor. Skilling opened his text by explaining that electricity is a scalar field: while it can be measured and made incremental electricity has no innate direction. Gravity, according to Professor Skilling is a vector field and as such it has direction and that no matter its application or situation that direction is constant. The electric automobile in the case of Tesla brings both these aspects to the fore: the electrical power employed in the Tesla is scalar and dramatically alters the equation of acceleration, and torque but its application into a car instantly brings forth problems of gravity and its vectoral path. The car rests on the ground; while in motion that resting is altered by the variable speeds, acceleration and deceleration. The electric car with its battery pack forming the floor pan has a newly lowered center of gravity—the application of electricity to car design alters the cars dynamics but in a more essential way the electric car conflates the physics of gravity with the scalar and in this case chemical nature of producing electricity. As exotic (if not convoluted) as this all sounds the Tesla Model S is still a car and it still sits in parking lots and one still drives it from a home X miles away...in other words: all of this genius barely spills outside of the cars beautifully shaped form and newly conflated authority of electricity and gravity.

So what does this have to do with architecture?

Professor Skilling did not see electricity as bound to purpose in a car or a plane or a rocket or a radio or computer. He saw it was both literal physics—as energy—but he also saw it in a conceptual or even abstract means. As electromagnetic energy electricity moves through things that stand still. It is a constituent of everything material. In

architecture it is, however, barely acknowledged except for its direct applications. It is in effect isolated from daily life but used to enable virtually every aspect of it. Tesla and Fremont have no immediate plans to alter this stable relationship but as Tesla moves its focus towards home energy and in particular home batteries and solar power an architect—that is, us—wonders how long the resistive capacity of the houses, the car and city as we know it can hold? That is for how much longer we will constrain the innovative capacity embedded in every day technology from altering the base instruments they seem to give life support to. At the moment Tesla's innovation promises a new life span for the car; and indeed for the single family house and its cartographic deployment.

Fremont could be the new frontier for architecture. Not as a parametric vision for assembly via Tesla's amazing robots or computer controlled production but instead as the electrical physical unbounding of the concepts that are part of the company's genius. Tesla, founded by a physicist, actually bases much of their faith in the ability to alter production (at all levels: financial or mechanical) in research into materials. While the electrical energy source alters the car's environmental impact it is a focus on adhesives, or materials strength and weight or indeed in chemical engineering that precipitates new ideas or means for tooling or mechanical engineering. Material and material meeting electricity drive Tesla—but: the image and the fantasy and fascination of the car remain. The semiotics of the car remains.

It is difficult to know which is in effect more abstract: the beauty of the car, its environmental techniques or the conceptual and then scientific work on material that alters the financial and mechanical models of the automotive industry (of a major commodity industry).
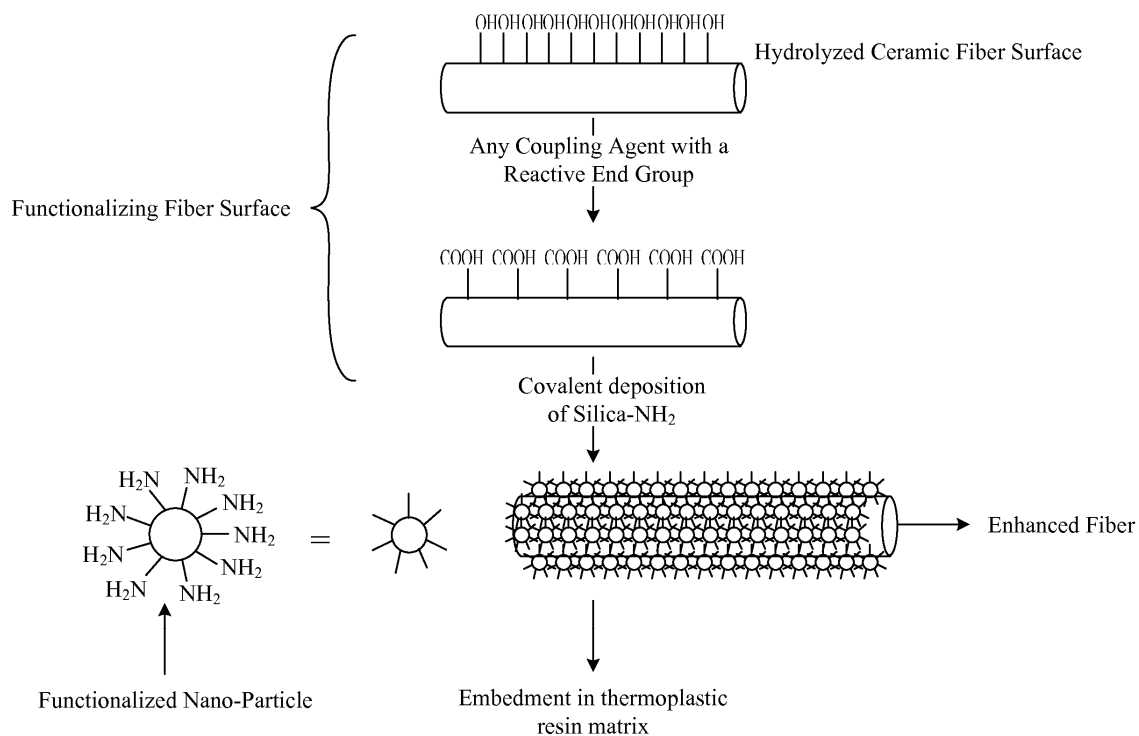
Mike Pillliod (Tesla materials engineer): Patent application: a topologically enhanced silica molecule for use as binding agent in iPhone production. The topologically enhancing coating can take the form of functionally activated nano-silica particles. In one embodiment, the nano-silica particles are functionally activated using amine groups. The thermo-plastic composite can be used to join a number of metal components together to form a load bearing structure

Architecture: vectoral aspects of gravity; scalar aspects of electricity. Thermal heat gain and loss—hours of labor both human and machine spent in its realization. Have we been living for decades and indeed a century inside a misbegotten conflation of weight and weightless—using electricity and its scalar means to shore up otherwise physically unintelligent

verctoral structure? Televisions on and supplied by current inside plywood diaphragms: nailed horizontally to 2 x 4 studs a quasi-gravity is induced to move horizontally. The answer is yes. We have.

Can the thinking of not just Tesla but indeed scores of Bay Area technology companies spill over the corporate walls and into the street, into urban planning? To achieve this we would need to believe that a new type of receiver is possible: that is, that the technologies are not born of a given commodity that sustains their economics. What becomes of the car if it is abstracted into a new mechanism but more so what happens to architecture if its sustenance by a denied life support is allowed to surface?

Above: Steel rolling mill, Ford Rouge Steel Plant: A constituent material / Steel / rolled in architectural and automatic shapes. A conflation of material as both building and commodity. The chemical and labor innovations beneath the scene are more difficult to discuss but present. Below: the glass plant, Ford Rouge factory.

1973: Despite the industrial violence an aesthetic prevails that both stalls and enables change: The image of the factory as laden with strife helps forge the environmental movement. Yet also seems to seed a recoiling from industrial imagination. Ford Motor Company: River Rouge Plant, Dearborn, Michigan

1971-73: the Centre Pompidou: an industrial aesthetic and a machine for art and culture. Sans actual production the factory is pristine four decades later. Photograph: Michael Bell.

B. (Other than) <u>a South Bay Utopia or Fremont (California) Siedlung</u>

The extension of BART is projected to enable easier access to jobs and also lower commuting costs. South Bay companies expect to rely on BART to bring employees from Oakland, Berkeley and San Francisco to the north. Whatever the effects of the newly extended rail system Fremont will have easier access to Silicon Valley; and the manufacturing sector of the South Bay will be linked by public rail to both the Valley and San Francisco. Housing costs in the Bay Area have long been a crisis; the regions fragmented public transit systems and the sheer scale of the Bay Area have placed a tremendous burden on highways and roads and on the overall cost of transportation. The Bay Area is, however, tremendously innovative in how it develops affordable housing. Our studio will take the housing sector of the BART development as a starting point but instead of seeing housing as a side bar or adjunct to the Bay Area's tech companies we will seek to bring the technologies outside the company gates. To, in effect, seek less of a distinction between technology or industrial company and its surrounding development. If this is possible how would the technologies manifest themselves: instead of a siedlung that socially and anthropologically identifies housing residents as workers; or a utopia that bends technology towards a simultaneous industrial and domestic purpose can we instead alleviate the ordained types to which technology is applied and instead unfold a potential space, a precursor to use or social need?

Image: Une Cité Industrielle, The Central Station coordinates residential, production and social life. Yet each zone is unique and given a special character. Tony Garnier

A utopian dream or a Siedlung for workers: either way we have used architecture as a restorative feature. Work occurs in one field—a factory; while domestic life in another. Even if conceived in unison they are seen in tandem. One allows the other but they also hold in reserve a means for one to limit the other. Image: Une Cité Industrielle, 1917, Tony Garnier
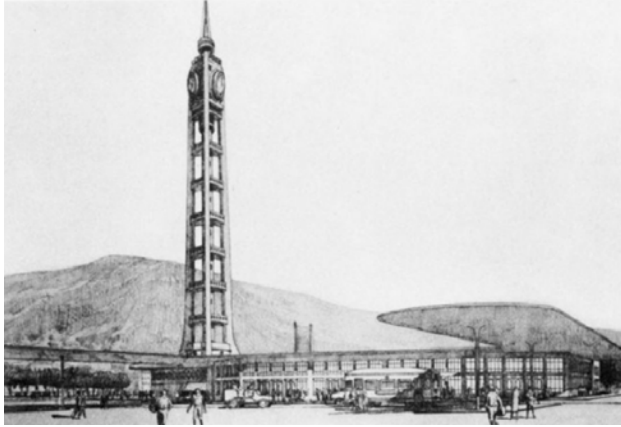
Image: Une Cité Industrielle, the Central Station, organizes the way in and out, Tony Garnier

Post Industrial City: And the Absent Architect

Affordable housing in the Bay Area, like most of the United States, is today driven by a myriad of housing policies designed to incentivize the market's ability to sever lower income households. Architects, often come to this equation late in the game after the financial or economic means are established. Working in Fremont and in the shadow of both the heavy manufacturing of Tesla our studio will seek an alternative: a scenario where housing is produced in ways that are of or similar to the means of production the technology industry portends.

In the early 1990s, as the US federal government was increasingly incentivizing the development of low-income, affordable and public housing within public/private partnerships, architectural discussion of these changes centered on design and planning initiatives instead of on financial or economic transformations of the development means. A goal was to break down the standardized housing blocks emblematic of the early decades of public housing and engage the entrepreneurial logic of the market as a driver of new housing solutions. At the root of the changes was an architecturally formless instrument – the Low Income Housing Tax Credit (LIHTC) – created by Congress in 1986 and intended to fund subsidized housing by deferred revenue rather than direct expenditure. It was also intended to shift ownership of affordable and public housing to investors who theoretically could deliver an antidote to the monolithic housing blocks and essentially customize subsidized housing development to local contexts and needs.

The shifts were monumental in scope, but were barely registered in architectural discourse: the formerly centrally funded, planned, developed, owned and managed public housing schemes that emerged since the 1937 Housing Act would over time be reborn as products of smaller-scale non-profit developers seeded by the sale of tax credits against profits they did not have. The actual credit, sold to a for-profit company that makes use of the credit, provides the initial equity to start a project. The changes have had an inverse effect on architecture, leading to a new mass-standardization of market housing construction techniques; an architectural heterogeneity applied atop a very uniform set of financial practices. This has also dramatically altered how and when architects engage with the design and social questions central to housing.

Deconcentrating Poverty: Topological Housing Policies

At the federal level the creation of LIHTC and an array of subsequent programs to reduced direct federal ownership of public and low income housing were in large part taken as a step to diminish concentrations of poverty in public housing developments. These programs were instigated under two left-to-center Clinton-era federal programs. Funds made available by the Department of Housing and Urban Development (HUD) for Public Housing Administrations (PHAs) during this period were also designed to address decades of deferred maintenance in PHA developments. Unable to take on debt, ageing public housing sites in the US long suffered a deficit in funding maintenance from rent rolls. Under HUD's new HOPE VI program, funding streams were targeted for renovation and repair, but the policies also required the demolition of a portion of each development's 'hard units', and the funding was only available if the PHA also agreed to

remove actual ageing apartments developed and managed since the PHA's inception by the New Deal legislation introduced in 1937.

New housing built to replace these hard units beginning in the 1990s and until only recently abated was intended for those on a higher income (not the original tenants) and paralleled a wider move by HUD towards using vouchers and other subsidies to alleviate rent – as 'soft units', these new dwellings (or now subsidized quasi-market apartments) have an attached yet portable subsidy (a voucher), but outwardly they were intended to appear as part of the wider and generalized housing market. Similarly, the Quality Housing and Work Responsibility Act (QHWRA) of 1998 offered means to 'deconcentrate' poverty concentrations that had become endemic in much public housing by allowing PHAs to more actively distribute their populations, but also to effectively become participating public owners within a non-profit corporation created to realize the new public/private housing required by HOPE VI and QHWRA.

Changes in the development mechanism meant that public housing, centrally funded, planned and managed since its origins 60 years earlier, has increasingly been built since the 1990s within the same building logics – labor, material, and financial means – as speculative housing. The often referenced and broad declaration of a decline in welfare-state funding was actually more accurately a shift of that funding from direct expenditures to a myriad of deferred-income instruments (such as LIHTC programs) Intended to instigate diversity or heterogeneity in public housing developments. At the architectural level this included a mandate to create a more heterogeneous building design—a veil of difference in the building facades designed to mask the otherwise large scale of the new housing. New quasi-public housing developments were realized within the same means of building that speculative housing in the US has long relied on – a market that has long been broadly acknowledged as inadequate at serving lower-income communities, and also lacking any great capacity for innovation.

Architect: Removed

Tax credits and the entrepreneurial mechanisms they were intended to incentivize would ideally carry a reflexive capacity tipping this market into an innovative milieu. Yet in many ways the opposite has been true. A case study I undertook in Houston, Texas, in 1998, as HOPE VI programs were taking hold, found speculative houses (in this instance, single-family homes typical for Houston) were built with virtually no architectural engagement. In one case of several hundred standardized houses I found the overall design fee paid for architectural services to be less than five thousand dollars or an average cost for design services per single family house of $12. Architects in the United States routinely seek 15% of construction costs as a design and architectural services fee; in this case the market had provided a professional fee of 0.028 per cent.

In US housing markets, mass-standardization has of course meant low, if not non-existent, design fees, but also little, if any, investment in research and development. While the debate of New Urbanism's relation to the transformation of public housing drew major attention in a range of ideological stances, it ultimately deflected the more urgent question of architecture's role in housing when the market is the denominator, and how the federal government, in seeking to disaggregate concentrations of poverty and incentivize the entrepreneurial aspects of capital markets, had also diminished architects' part in the deeply social and material aspects of housing.

Tax credits and the myriad of financial instruments invented in the United States since the early 1980s created a new strata of affordable and low-income housing development, but when coupled with a somewhat normative building industry and a latter-day form of syndication and distribution of the credit allocations (a highly constructed market for the sale and purchase of tax credits), a new, generally non-innovative genre resulted that essentially sought to occlude the presence of these funding streams – the past modelled on the mode of neo-vernacular architecture here makes it difficult to see the actual financial, social and, ultimately, economic history of what is being worked on.

What happens if the financial incentives were removed or if their presence were not invisible? Can we move the discourse of how housing and technology meet.

Santana Row: San Jose, California. A neo-gothic kiosk against a seeming iron truss. The development innovatively fuses retail, offices, and housing but seeks its expressive language in history. Tax credits, new zoning, new financial means: semiotic architecture.


Tesla has been the recipient of a great deal of federal support in the form of direct loans and tax abatements—yet unlike the application of these devices to housing it has also focused on what seems to be a surprisingly luxurious and high performance commodity. A car.
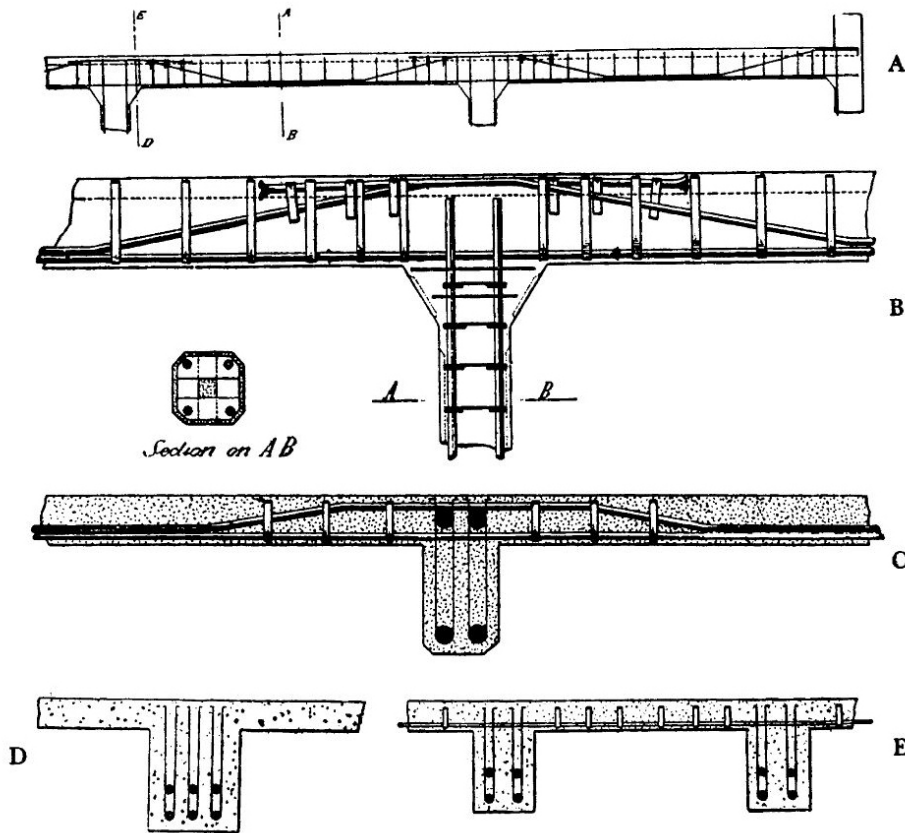
HENNEBIQUES SYSTEM OF REINFORCED CONCRETE

A. SECTION THROUGH BEAM.

B. JUNCTION OF BEAM AND COLUMN.

C. CROSS-SECTION THROUGH BEAM AND FLOOR.

D. SECTION THROUGH MAIN BEAM.

E. SECTION THROUGH SECONDARY BEAMS AND FLOOR.

F. MAIN BEAMS, SECONDARY BEAMS AND FLOOR, FORMING A MONOLITHIC MASS.

G. METHOD OF REINFORCING COLUMNS.
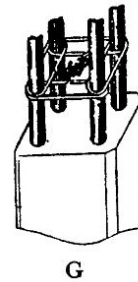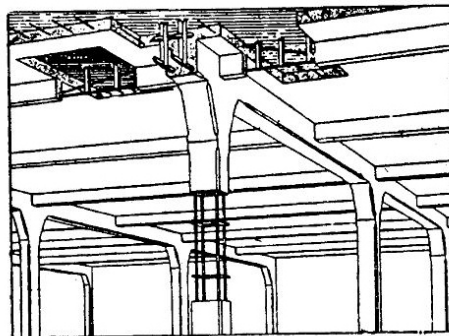
Garnier's Une Cité Industrielle made use of reinforced concrete in both the housing and the factory sectors. While the social uses were distinct the materials bridged both realms. In the domestic sector, however, Garnier's drawings depict a romantic deployment of nature that wrapped the building masses. He also made use aedicule window and portal doorways keeping the horizontal windows and long overhands for factories and public buildings. Image: Une Cité Industrielle, 1917, Tony Garnier

C. Abstraction and Realism: Life at the Infrastructural Level

Image Source: The NY Times. http://www.nytimes.com/2011/08/16/us/16pedestrians.html?_r=0

In the news: Dangerous highway crossing: studies show that the poor are the most likely to be subject to dangerous highway crossing. The integration of public transit and highways means that pedestrians are most at risk—pedestrians that use bus lines in otherwise auto-centric cities.

Despite the lack of a pedestrian milieu in most United States sprawling cities today the reality of public transit means many people find themselves stranded, isolated or simply trying to navigate spaces intended for automobiles. The substrate of this zone, roads and bridges, traffic lights and a semiotics of lines and stipes are all a components of infrastructure and indeed funded as a public work and investment. Restoring a semblance of public space at the pedestrian scale seems unlikely. The realism of the situation is not without acknowledgement in art or art history—is there a role art can play in re-imaging these zones. Part of our work will be to separate the narrative from the infrastructure; that is, to see the mechanics of infrastructure and imagine their re-deployment and thus new narrative.

Art: "Albuquerque, New Mexico, 1972," by Lee Friedlander. He said he deliberately includes "those poles and trees and stuff" that other photographers avoid. A less daunting but nonetheless people less street scene.

A series of lectures by Frank Stella in the mid-1980s found the painter acting as critic/scholar. Describing a visceral relationship between architecture and painting once embodied in a mechanics of pictoriality, Stella was seeking a new mode of plastic art in an era seemingly dominated by linguistic reference. His visceral attention to detail brought history directly to the present and in effect gave linguistic narrative to the abstract spatial mechanics of the works he analyzed. His work was full of architectural potential but was there a corollary concern in our field.

But his goal was to reveal something that in effect superseded the narrative—

The mechanics were the story. In Mondrian's New York City, Stella saw a total eradication of a bodily plasticity yet gave the abstraction a plastic timbre. "It is here that Mondrian rattles the bones of human configuration for the last time; it is here that the white rectangle steps out of the background landscape into its own space", wrote Stella. Orbiting back to the Renaissance and as far forward as urban graffiti he looked at ways in which painting begat a more palpable and occupy-able plasticity—a contemporary place for a still plastic body. The palpable way space was described seemed lost in architectural criticism at the time and more so today. With closer reading of Stella's text as a starting point what is possible today—that is, how do we speak of a contemporary plasticity as we acknowledge the depth of other forms of non-plastic agents in the shaping of space?

Arid-Plasticity

Our studio will take a series of lectures given as the Charles Eliot Norton Lectures by the painter Frank Stella at Harvard University in 1983-84 as the outset for our work. The series of six lectures were compiled and presented as the book Working Space in 1986. Stella's lectures had a strong relationship to architecture and to a mechanics of pictoriality, that while noted at the time as potentials for architecture design, were also countered widely by a seemingly more dominant realization of architecture by way of linguistics. Stella was exploring a way to achieve a pictorial plasticity in painting (again and in new ways) after modernism's gradual and seeming total flattening or compressing of pictorial space. Part of what was so powerful in the book's timbre and detail was the immediacy in the analysis of other painters—and a kind of
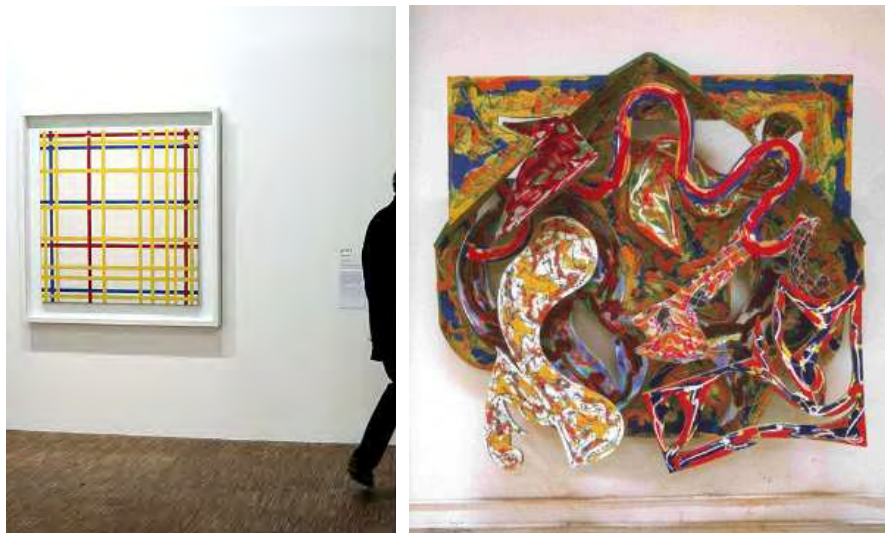
authority of tone that came from Stella's own practice.

Stella's descriptions of space resonated, however, with a quality in cities at that time—a blankness and flatness of experience that architectural theorist were beginning to describe as "terrain vague"—a space where the presence of a person was real, but hardly acknowledged in the no-man's land of near abandoned spaces between building as isolated capital-instruments. Ignasi de Solà-Morales work on the term terrain vague arrives concurrent to Stella's lectures; Mike Davis "City of Quartz" is published eight years later. Davis' reading of the political mechanics that created and sustained an anomie of the street level experience in Los Angeles were never related to Stella's work but together, Stella (Working Space) and Davis with Solà-Morales provide a sense of painting and architecture diagnosing an arid yet barely plastic urban life where the dissipative quality of space needed but could not (as yet) sustain a new plastic direction. This space was shored up by plastic spatial tropes, literal policing and intimation of real and implied surveillance. If Stella seemed to be describing this aridity and trying to create something new from it—in part by going back into history and bringing forward a renewed and transformed mechanics of the plastic. His work traced a vivid "hot-blooded" structure that was simultaneously laced with emptiness as it was literally becoming spatial and quasi-architecture, quasi-sculpture. The work seemed to have a kind of evaporative quality—plastic and plasticity drained away at the same time. Stella had a path into a NEW plastic architecture that seemed to not have been understood by architects---this is our beginning.

Our studio will work from and into Working Space and add to this important study in the practice of art and practice of history/criticism a component of our field's material/spatial history. Like Stella we will cast our focus back into history and jump forward again to our moment.

But his ideas launch us here as we now take on an industrial site in California, the Tesla plant where the appearance of things is far removed from what is actually happening and the story, of commodities, stock prices, electric cars, torque and acceleration and Silicon Valley all conspire to keep the real story out of the hands of the citizens. Our studio is not expose but it is a brutal mission to bring to the surface so much that is hidden.

So how do we begin: with oil, with gasoline, with data and demographics—none of the above? With electricity—yes electricity? Start-

A Narrative Betrays the Genius of the Plastic Achievement: Caravaggio

1. Frank Stella on Caravaggio, David and Goliath (1599): In order to grow and endure painting must understand the mechanics of its expression.

It may be that their florid sadism springs from a perversion hidden in the creative process. The savagery of these paintings cuts in two ways: on one hand, it reveals a pictorial forces so obvious that we can all see and share it; on the other hand it demeans its own effort by denying our understanding the importance and relevance of each painting's subtleties.

Frank Stella, Working Space

Abstraction but with Ground and Weight

2. Paul Cézanne, the Bathers, 1898. Stella compares the abstraction evident in the Bathers with what he sees as a strong presence of gravity and of a figure ground. The uses of the earth tone ground and the triangulation of the trees forging the perspectival depth.

If abstraction has doubts about its ability to survive on its own, it has to take another look at where it came from, to reconsider its relationship to the mechanics of representation.

After all, the gestures of abstraction are no more than the revealing of magnification of the gestures of its heritage.

Frank Stella, Working Space

A Without Weight / Without Touch: Kandinsky

3. In Kandinsky Stella saw a point of no return: the epitome of abstraction was reached when form lost it semiotic base and the oil paint was applied without a recoverable sense of touch or weight.

Kandinsky knew from his experience of Expressionism and Fauvism that twentieth century art was infatuated with the reality of pigment, that it was stuck to the plane of pictorial surface.

This reality of pigment, the inevitable weight of the touch of the artist's hand, was something Kandinsky hoped to deny.
He expected to paint and compose with a new freedom, seeking to dissolve the ground plane of the past into a surface of contiguous weightless relationships.

Frank Stella, Working Space

Adapation: The _Form_ of Empathy and its Plastic Presence

A newly immense theatre: Drive-in movie—Detroit, 1955: Taking the inside spectacle outside. The movies offered the car as a new seat; the outdoor nap seems destitute by comparison or perhaps mildly disorienting. Robert Frank. The Americans


Adaptation: American try to maintain old rituals but the proximity of the machine has both liberated them and made their space uncomfortable. The American's are displaced, lost adjacent to their own means of liberation. They don't yet miss the city. Robert Frank. The Americans

The emergence of photography and its application to photo-journalism and print media accelerted the application of perspctive and picitoral means to social or political events. It also sustains the distancing of perspective and the uses of perspective to frame a reproduce a subject. Stella text does not address photography and his search for a renewal of abstraction in large part leaves social or political commentary aside. But over a century of advances both the camera and lens and the negative or photographic print instigate a search for a photographic art and a photographic journalism. An application of the photograph and its content to social purpose; a revealing of social purpose in photographs. In a contemporary scenario the chemical action of prinitng photographs has given way to a digital display of LED's but despite the medium specificities and shifts in technology the role of light, the contour of a body or face—there is a resoancne with histories in art that are long standing. In the examples that follow one can see a focus on social issues becoming

formal (Moholy-Nagy) or where a social crisis of national scale becomes immediate in the gaze of the subject (Dorothea Lange). Can one upate the term chiarascuro? How do we account for the platic qualities of a figure in space today?

Moholy-Nagy: Up with the United Front, 1925-30: This documentary-style photograph is unusual in Moholy-Nagy's oeuvre during this period and may have been taken serve as source material for an exhibition design or a commercial project. However, two large prints of the image exist in the Getty Collection, both bearing the artist's wet stamp, suggesting that it was meant to stand alone. The sea of people attending this rally for the Factory Workers Association in Berlin dissolves into a pattern of round faces and hats that would have been of visual interest to Moholy-Nagy
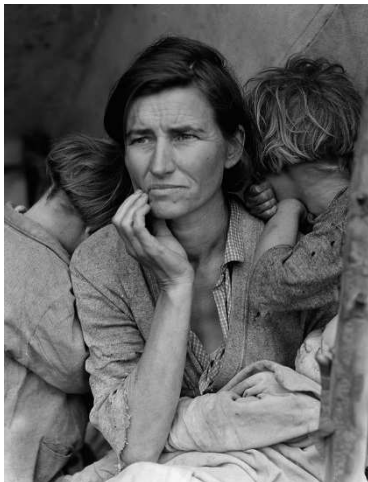
A Chiaroscuro of Poverty: Dorothea Lange, Migrant Mother Photograph, detail. Florence Owens Thompson with three of her children, 1936

Interiors: NYC tenements at the turn of the last century. A conflation of poverty and interiority required a photo journalist with private access. A century later poverty and housing struggles are far more likely to be suburban: In New York City the photographer Jacob Riis dedicated his work to revealing what at the time was both a new and un-understood form of urban poverty. Riis had help from then Police Commissioner Teddy Roosevelt in gaining access to tenements and taking the photographs he later published as How the Other Half Lives: Studies among the Tenements of New York.

Above: Jacob Riis, Five Cents Lodging, Bayard Street, c. 1889

The Architectural Window/Camera: Four Centuries of Sources

The window, the room, the lens the camera: over centuries artists, photographers, film-makers, and today scientist remake the window. As an optic instrument the window frames a subjects actions pictorially but also instigates a thermal project that conflates perception of light and heat—the window's role as a framing device today is perhaps its least contemporary role. Vermeer, it seems, was deeply aware of the inanimate and delicate balance of everyday life.

Our work will seek to understand and project a new role for figure (of a subject) but also how that subject alters the space they occupy—alters your work.


Johannes Vermeer, Woman Holding a Balance, 1662-63

Yet his cool, omnivorous mind is everywhere, polishing every granule of surface until it communicates the maximum of visual information: about the painting on the wall behind...the light filtering through the slightly open stained glass window.

One of Vermeer's distinguishing strengths, beyond his skill at rendering the human figure (which de Hooch lacked), was his supreme evenhandedness. Painting the animate and the inanimate as if they were of equal import, he paradoxically implied the relentless inner pulse of life and thought, but from a discreet distance.

Roberta Smith: The New York Times, Friday, March 9, 2001, "Vermeer and the Delft School: Magic Turns Light Into Life"
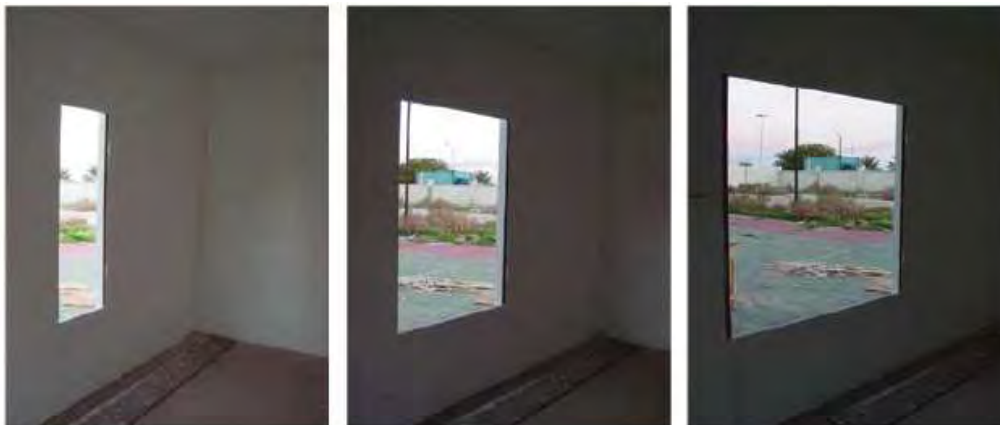
Michelle Addington, engineer and professor of architecture reveals that the quality and experience of light in a room is a component of contrasting light zones; we perceive great light levels when they are sequentially contrast with less light. The window as camera lens shapes the space and the subject understand space as a cognitive and physiological experience. While darker the space feels well lit. "The desire for day lighting has led to larger and larger surface areas of exposed glazing. This, in turn, has increased our dependence on both electric lighting (for managing contrast) and environmental systems (for managing envelope loads). Nasser Albuhassan worked

with a visual psychologist to develop a method for dramatically reducing the surface area of glazing by establishing sequential contrast zones within the field of view, thereby improving day lighting. By manipulating the frequency with which these zones appear on the retina of an ambulatory occupant, Nasser was able to demonstrate that much lower light levels in the interior could be perceived as having improved day-lighting."

Site

Warm Springs Station and Irvington Station

Site Documents are posted to CourseWorks