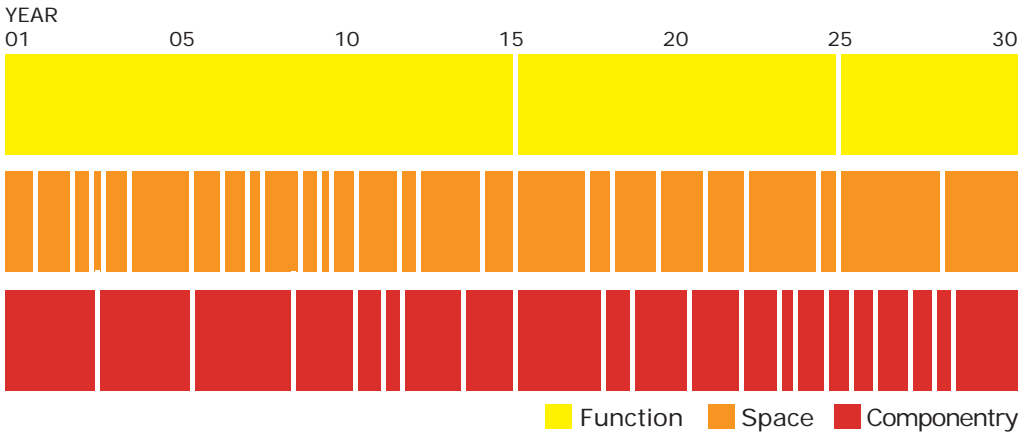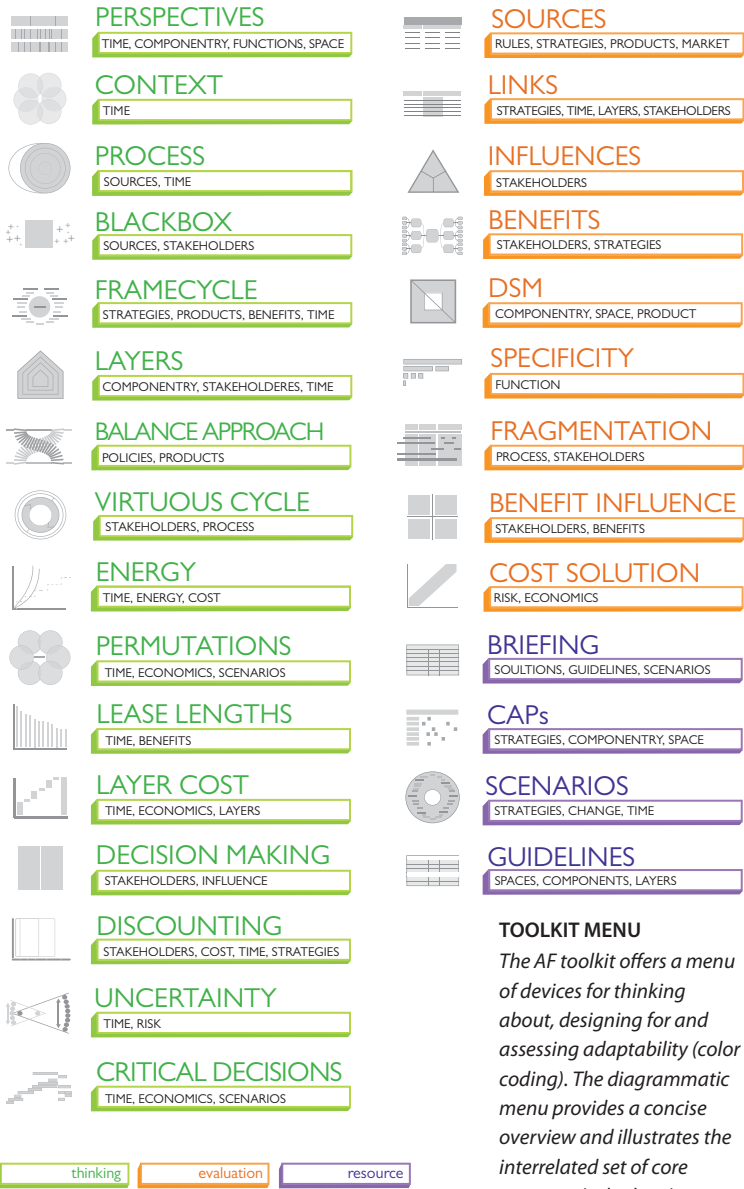# Thinking + Talking Adaptability

DIAGRAMS FOR TIME AND CHANGE
IN THE BUILT ENVIRONMENT

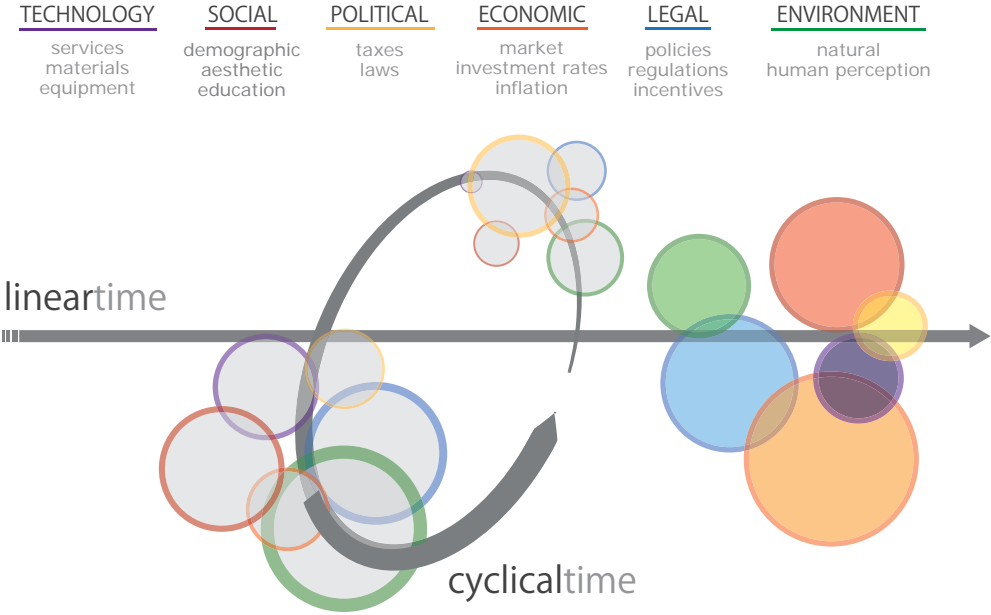ROGER SCHMIDT III, SIMON AUSTIN
AND JAMES PINDER

The Adaptable Futures (af) group at Loughborough University has sought to improve stakeholders' capacity to deliver adaptable building designs and the adaptive reuse of our building stock and urban spaces. The research has provided an expanded and refined understanding of how to design for and implement adaptability—a response to what we see as a lack of shared understanding across stakeholders and a need to (re)conceptualize buildings in context and time. Buildings can no longer be conceived as static and isolated objects, but as unfinished social products susceptible to change and demanding of strategies to accommodate the diverse cycles of their constituting parts and stakeholders.
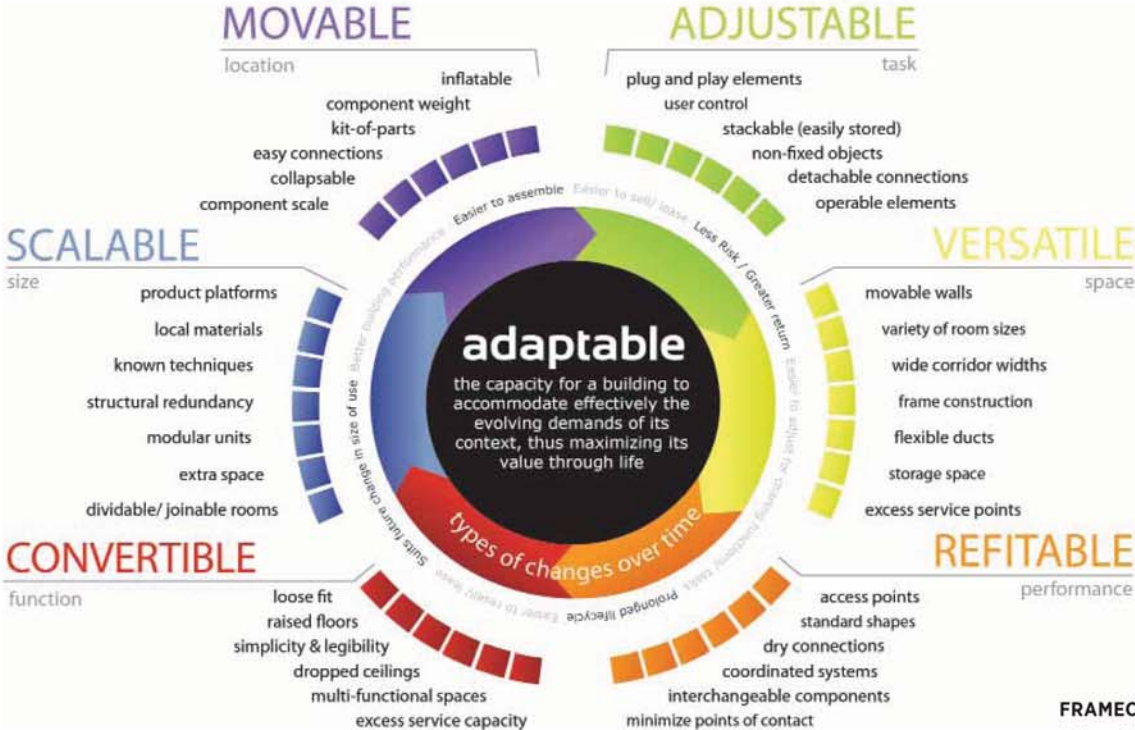
One of our primary deliverables was a series of interrelated communication devices to serve as a foundation for the af toolkit—a set of briefing instruments, analytical tools and design resources. The concepts of time and change are at the heart of each device and provide a finer grain when thinking about adaptability, clarifying how different types of change occur over different scales of time and within different layers of a building. The robust set of

PERSPECTIVES
TIME, COMPONENTRY, FUNCTIONS, SPACE

CONTEXT
TIME

PROCESS
SOURCES, TIME

BLACKBOX
SOURCES, STAKEHOLDERS

FRAMECYCLE
STRATEGIES, PRODUCTS, BENEFITS, TIME

LAYERS
COMPONENTRY, STAKEHOLDERES, TIME

BALANCE APPROACH
POLICIES, PRODUCTS

VIRTUOUS CYCLE
STAKEHOLDERS, PROCESS

ENERGY
TIME, ENERGY, COST

PERMUTATIONS
TIME, ECONOMICS, SCENARIOS

LEASE LENGTHS
TIME, BENEFITS

LAYER COST
TIME, ECONOMICS, LAYERS

DECISION MAKING
STAKEHOLDERS, INFLUENCE

DISCOUNTING
STAKEHOLDERS, COST, TIME, STRATEGIES

UNCERTAINTY
TIME, RISK

CRITICAL DECISIONS
TIME, ECONOMICS, SCENARIOS

SOURCES
RULES, STRATEGIES, PRODUCTS, MARKET

LINKS
STRATEGIES, TIME, LAYERS, STAKEHOLDERS

INFLUENCES
STAKEHOLDERS

BENEFITS
STAKEHOLDERS, STRATEGIES

DSM
COMPONENTRY, SPACE, PRODUCT

SPECIFICITY
FUNCTION

FRAGMENTATION
PROCESS, STAKEHOLDERS

BENEFIT INFLUENCE
STAKEHOLDERS, BENEFITS

COST SOLUTION
RISK, ECONOMICS

BRIEFING
SOULTIONS, GUIDELINES, SCENARIOS

CAPs
STRATEGIES, COMPONENTRY, SPACE

SCENARIOS
STRATEGIES, CHANGE, TIME

GUIDELINES
SPACES, COMPONENTS, LAYERS

thinking | evaluation | resource

TOOLKIT MENU

The AF toolkit offers a menu of devices for thinking about, designing for and assessing adaptability (color coding). The diagrammatic menu provides a concise overview and illustrates the interrelated set of core concepts (color bars).

YEAR
01   05   10   15   20   25   30

■ Function ■ Space ■ Componentry

DESIGN PERSPECTIVES

One way of looking at design is to think about the interplay between function, space and components and how they will evolve over time (independently, together, sequentially or in tension). Unraveling change events (white vertical lines) enmeshed in the three interwoven perspectives suggests a unique 'code' for the life of every building.

INTERGRATING CONTEXT

The integration of time forces the recognition of architecture's symbiotic relationship with context. Context is more than the physical characteristics of the building site, taking into account a range of physical and social factors that impinge on the design and use of our built environment - shifting influence, role and scale throughout time.

TECHNOLOGY
services
materials
equipment

SOCIAL
demographic
aesthetic
education

POLITICAL
taxes
laws

ECONOMIC
market
investment rates
inflation

LEGAL
policies
regulations
incentives

ENVIRONMENT
natural
human perception

lineartime

cyclicaltime

FRAMECYCLE

Adaptability is defined and articulated as a finer grain of six motivational goals working clockwise with respect to their potential frequency. Each high-level strategy (type of change) is illustrated with a set of products, systems or tactics (grey text around the periphery) and a more general list of stakeholder benefits (grey text around the inner circle).

diagrams is theoretically grounded in the literature and has evolved through an iterative and reflexive process of qualitative research methods.

Individually or as a suite they serve to enhance conversations between stakeholders, not only regarding adaptability but also the broader issue of sustainability, helping to ameliorate the lack of clarity often found in design briefs—i.e. elucidating needs through improved communication. They have been used in different forms to facilitate individual discussions and larger group workshops as conversational prompts and interactive exercises that visualize

architectural and motivational concepts, allowing stakeholders to focus their mind and produce sharp responses.

The visual catalogue forms a rhizome of interconnected concepts allowing multiple and unique pathways to be forged through the issues at hand and for stakeholders to appropriate them for their own end. The set of tools help to untangle the complex web of dependencies that induce, hinder and accommodate change and push stakeholders to think beyond the stereotypes of what constitutes adaptability and how a building may accommodate future change.

BUILDING LAYERS

(Adapted from Brand, 1994) Buildings can be envisioned as a set of 'shearing' layers that change at different rates—the more the layers are connected, the greater difficulty and cost of adaptation. In general the design will be controlled by the slower changing components (e.g. structure restrains skin).
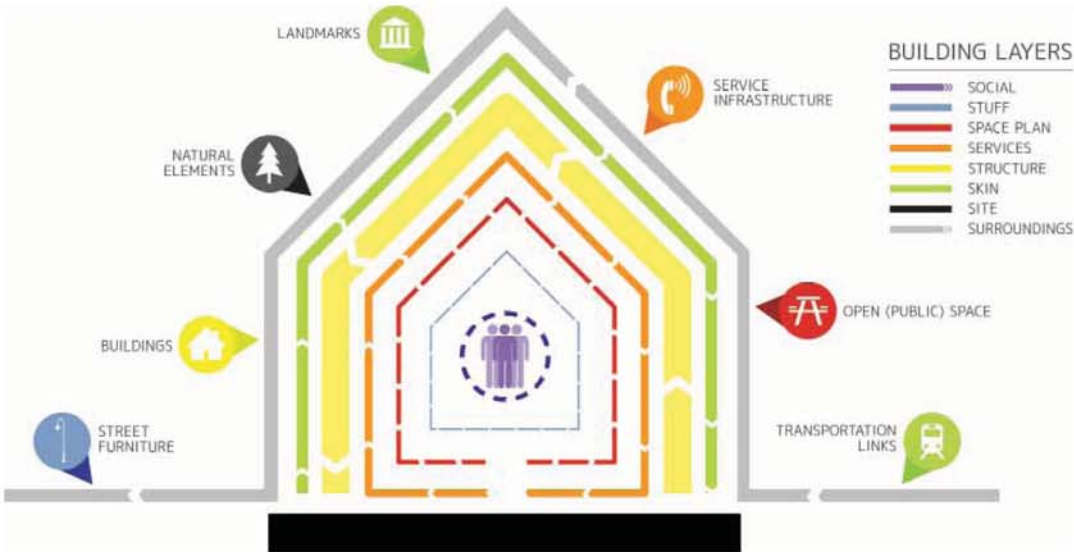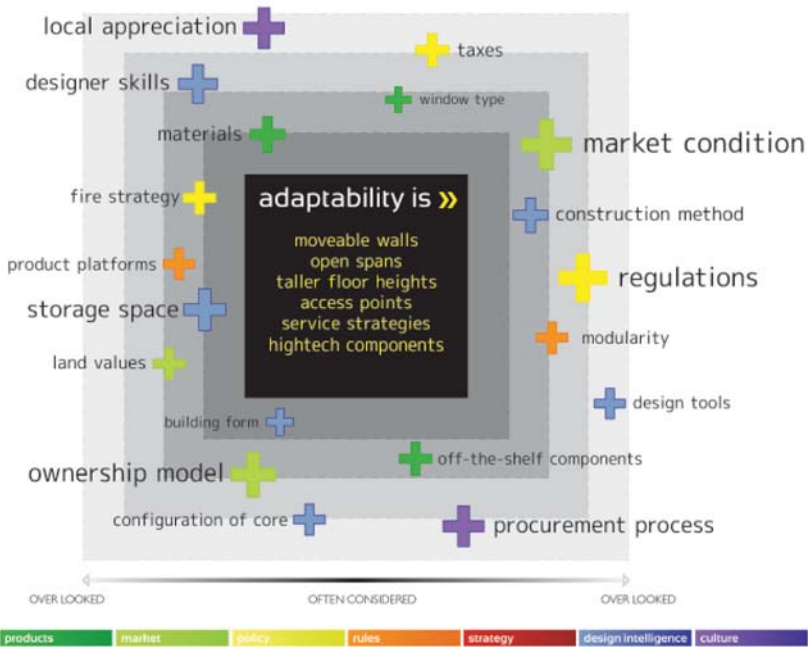

types of change			building layers						stakeholder		
strategy	social (cause)	physical (affect)	stuff	space	services	skin	structure	site	enabler	benefactor	funder
adjustable	task, user	equipment, furniture	■						user	user	user
versatile	activity, operations	spatial arrangment		■					FM	user	user/owner
refitable	age, technology	component	■	■	■	■			FM/owner	user/owner	user/owner
convertible	ownership	function		■	■	■			FM/owner	owner	owner/ dev
scalable	market	size, loads		■	■	■	■		owner	user/ owner	owner/ dev
movable	demographics	location			■	■	■	■	owner	owner/ society	developer

Key		■ probable	▢ possible

ADAPTABILITY LINKS

The table links distinct types of change, building elements and stakeholder roles as a platform for interrogating the why, how and who of adaptability.
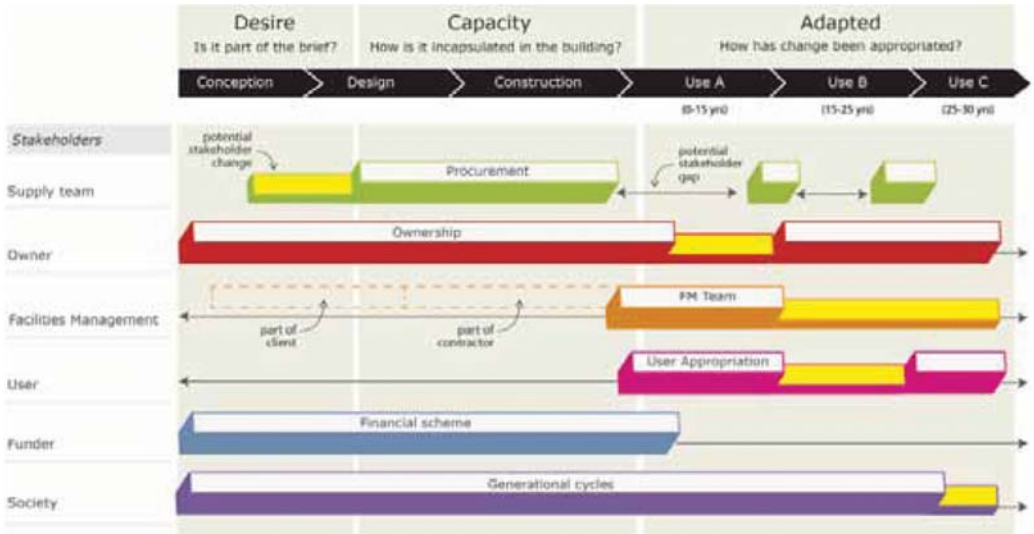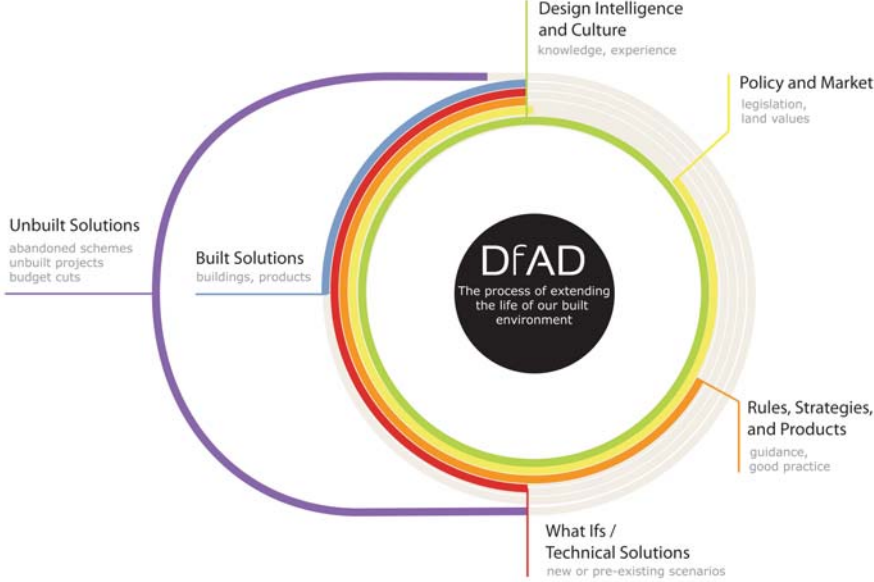
ADAPTABILITY SOURCES

emerged to explain where our knowledge, resources, and constraints of adaptability come from—aspects that hinder, enable and/or accommodate change. They range from the very physical, short life-time of building products (timebound) to enduring behaviors and values of organizational culture (timeless).

Products »	Market »	Policy	Rules »	Strategy	Design Intelligence »	Culture »
Technical or system solutions	Economic conditions	Legal framework for industry	Principles for building parameters	Approaches towards change over time	The (re)use of knowledge and skills	Patterns of actions, knowledge and objects
Standard details	Financial schemes	Building regulations	Service	Adjustable	Philosophies	Artefacts
Iso standards	Interest rates	Planning laws	Structure	Versatile	Experiences	Values
Pre-designed products	Economic condition	Government incentives	Spatial	Convertible	Protocols	Behaviours
	Land values	Demolition tax		Scalable	Solutions	
	Material costs	Resource tax		Refittable	Tools	
	Ownership models	Industry guidance		Movable		

timebound → timeless

Design Process

The sources play-out at different points in the design process (clockwise). The simple idealized illustration suggests the sequential condition between the seven sources in time.

Design Intelligence and Culture
knowledge, experience

Policy and Market
legislation, land values

Unbuilt Solutions
abandoned schemes
unbuilt projects
budget cuts

Built Solutions
buildings, products

DfAD
The process of extending the life of our built environment

Rules, Strategies, and Products
guidance, good practice

What Ifs / Technical Solutions
new or pre-existing scenarios

BLACKBOX OF ADAPTABILITY

Adaptability is typically defined by a limited number of physical characteristics (the stereotypes), whilst many other variables are left 'outside'. The 'black box' of adaptability will be different for everyone—thus, the growing shades of gradation suggest a variety of possible 'boxes' (moving from the more conventional in the center to the lesser associated elements on the periphery).

local appreciation
designer skills
taxes
window type
materials
market condition
fire strategy
construction method
product platforms
adaptability is » moveable walls, open spans, taller floor heights, access points, service strategies, hightech components
regulations
storage space
modularity
land values
design tools
building form
ownership model
off-the-shelf components
configuration of core
procurement process

OVER LOOKED   OFTEN CONSIDERED   OVER LOOKED

products | market | policy | rules | strategy | design intelligence | culture

FRAGMENTATION

The fragmented and disaggregated nature of stakeholder involvement over the course of a building's life is frequently at the root of issues that hinder adaptability. A partial product of the usually long time lapse(s) between conception (desire for), design (capacity of) and implementation of change (adapted).
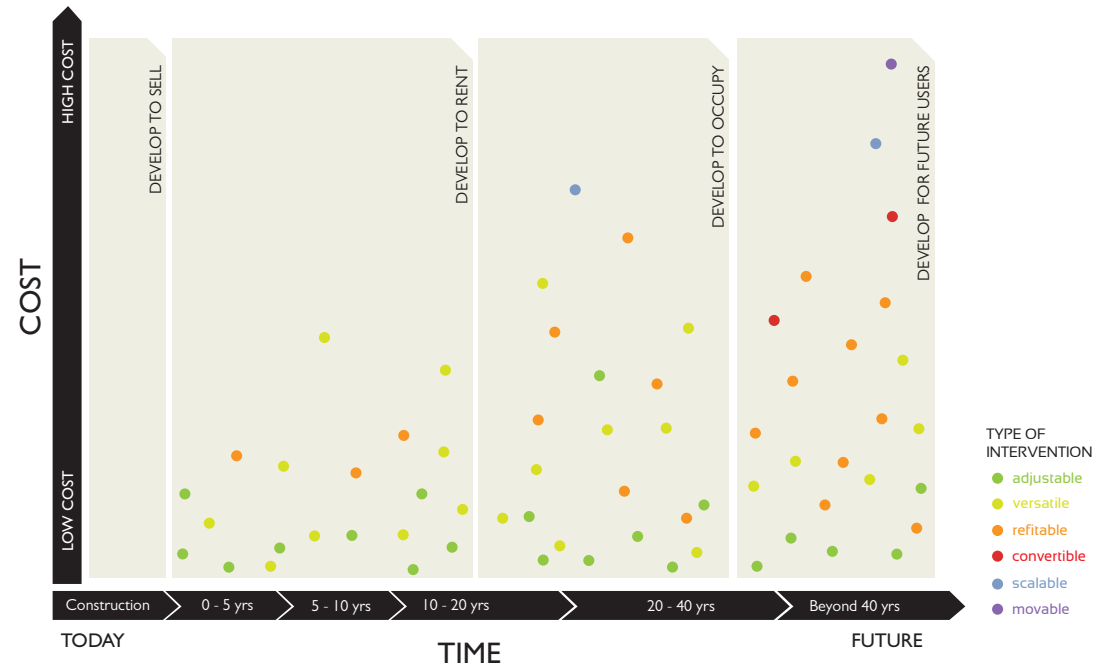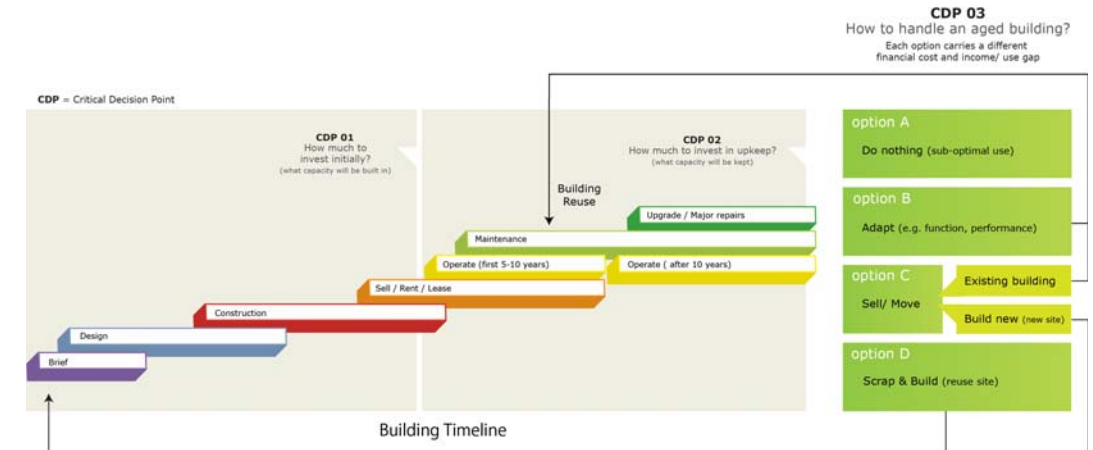

Desire — Is it part of the brief?	Capacity — How is it incapsulated in the building?	Adapted — How has change been appropriated?

Conception > Design > Construction > Use A (0-15 yrs) > Use B (15-25 yrs) > Use C (25-30 yrs)

Stakeholders
Supply team — Procurement
Owner — Ownership — FM Team
Facilities Management — part of client / part of contractor — FM Team
User — User Appropriation
Funder — Financial scheme
Society — Generational cycles

LEVELS OF SPECIFICITY

*(right, top) for which
we understand and
design buildings can be
characterized at five levels –
from the most generic (level
01, all buildings) to the most
specific (level 05, tailored
to a specific use, client and
site). The diagram alludes to
the derogatory relationship
between being responsibly
specific and sensibly
indeterministic.*

Future Discounting

*Different ownership
models will affect a
developer's wiliness to pay
(WTP) for certain features
relative to their timescale
horizons. The probability
of certain types of changes
grows with increasing risks
and wiliness to pay for
solutions to mitigate
against downstream costs.*

**TYPE OF
INTERVENTION**

- adjustable
- versatile
- refitable
- convertible
- scalable
- movable

Levels of Investment

*A developer/ owner's
projected length of
involvement is often the
basis over which they are
willing to plan/ invest for
future change. How much
they invest up front
(critical decision point 01)
and for operational
maintenance (CDP 02) will
help determine the point
in time and their actions
for when the building is no
longer suited for their
needs (CDP 03).*

Project Pull

*Architectural design can
be seen to be 'pulled' by
factors which either sit
inside the practice, inside
the specifics of the project,
or outside both
(exogenous factors). The
diagram provides a
theoretical space for a
dialogue around
understanding the social
context in which design
takes place, dimensional-
izing the complexity of the
forces at play.*