

# Aspirational City Futures:

## A short review of Foresight approaches

**Hunt, D.V.L. and Rogers, C.D.F.**

The University of Birmingham

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The views expressed do not represent policy of any government or organisation.

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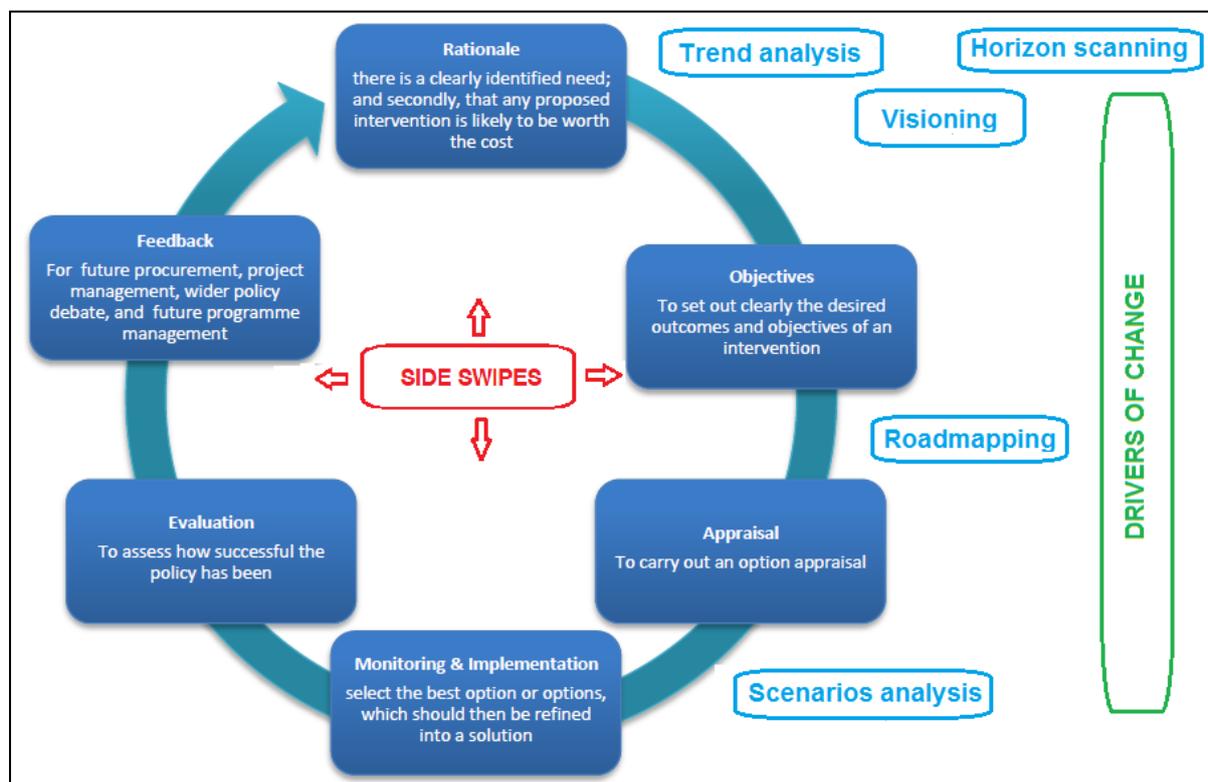
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## 1.0 INTRODUCTION

The origins, meanings and uses of ‘future cities’ in the current discourse, including definitions, trends and pathways of knowledge, are well documented, moving far beyond the focus of sustainability (Moir *et al.*, 2014). In a world that is constantly and rapidly evolving, it is most likely that future cities will be very different from the present and the amount of change that occurs therein will depend on just how far into the future we go. The further we go the more uncertainty there will be, and hence any methodological approach that allows meaningful creation of city policies targeted at the far future must reflect this. Foresighting approaches, as they have become known, are relevant to such a requirement, not least because they can significantly enhance the efficacy of future city policy making (Foresight, 2008; HM Government, 2014). These approaches include, but are not limited to, the following:

- 1 Trend analysis
- 2 ‘Horizon Scanning’ or ‘3 horizons’
- 3 Side-Swipes or Black Swans
- 4 Scenarios analysis
  - a. ‘Aspirational’ or ‘Success’ scenarios
  - b. ‘Extreme yet Plausible’ scenarios
  - c. Scenarios predicated on one or more dominant drivers

Their approximate location within the policy cycle, based on reports of where the approaches have been most useful, are shown in Figure 1.



**Figure 1.** The policy cycle, simplified in the ROAMEF model, showing where foresight approaches have had most impact (modified from HM Government, 2014)

**Trends analysis** (Approach 1), and branch analysis used therein, forms a cornerstone of the approach which cities and the UK government currently adopt (GO Science, 2009), and as such it is well understood.

However, used in isolation there are shortfalls: by beginning with the present and working forwards, trend predictions for the longer term (>30 years) will most likely be wrong as the world is inherently uncertain (i.e. contexts and ways of doing things change, as do the technologies that affect / enable them, and so on) – the question is: to what degree? Hence cities would be better placed to make long-term policies by supplementing trend analysis with potentially more pertinent approaches, such as the following.

**Horizon Scanning** or the ‘3 horizons’ technique (Approach 2) is a very well-known and often applied futures approach (Foresight, 2003; EA, 2006; Curry et al., 2005; NERR, 2009) which uses emerging issues that are starting to appear from within an evidence base and considers them for city thinking/planning in three horizons: (i) short (0-2 years), (ii) medium (2-5 years), and (iii) slightly longer-term (5+ years). Whilst the method is applicable and could be useful for city policy development, it requires significant use of knowledge management software, application of metrics and production of scanning documents. In addition it might be suggested that for the much longer time consideration applicable to future cities (>20 years) the process is beyond most, if not all, city capabilities as they currently stand.

**Side Swipes** or **Black Swans** (Approach 3) and mega shocks, whilst of low probability, are highly impacting (GO Science, 2009; Hajkowicz and Moody, 2010), often affecting future policies profoundly and instantaneously. In a city context their consideration allows for ‘responsive mode’ future requirements to be considered for events that are largely unexpected with unanticipated effects – for example, major disruptions caused by technological failures or natural disasters (Taylor *et al.*, 2007). Again these are directly relevant to future city policy making and should not be ignored, although they are beyond everyday considerations for a city.

**Scenarios analysis** (Approach 4) offers the distinct advantage to long-term policy making of allowing assumptions, values and mental models to be challenged (Miles, 2005; Karlson and Øverland, 2012) when considering ‘narrative based story telling’ (Approach 4). This moves cities from trend-based or megatrend-based approaches to a more exploratory type of approach (Section 2), whereby related foresight tools and techniques allow decisions and policy making to be created more consciously and effectively by asking ‘*what if?*’ questions. This serves to inform the derivation of a range of plausible / probable / possible / preferable alternative future city states using words and numbers (Raskin, 2005). Each method is no more or no less useful than the other, and in fact the most desirable approach would seek to use all of them in combination, thereby allowing future pathways to be viewed in a variety of ways using multiple (rather than individual) lenses (Hunt *et al.*, 2012; NES, 2009). However, this aspirational approach is undoubtedly influenced by a number of constraints – most notably time, cost and experience. That said, it is worth getting the process right in order that it becomes more than an academic exercise by impacting policy-making in a meaningful way.

An ‘**Aspirational**’ scenario approach (Approach 4a) is often described as a preferential path to a preferred city vision and, in terms of the way it is developed, it shares many characteristics with, and thus should be considered as a subset of, conventional scenarios analysis. However the term ‘path’ is unhelpful in this description, since the approach relies on scenario development and ‘backcasting’,

i.e. a normative methodological approach whereby future options are analysed devoid of the requirement to consider what futures are likely to happen or how they are likely to develop, but with an overarching momentum to understand how desirable futures can be attained (Bezold, 2009a,b) or undesirable ones avoided. As such, 'backcasting' contrasts significantly from forecasting, not least due to an explicit focus on desired outcomes and city scenarios that require a step change in the current state of play in order to achieve a preferred vision. Scenarios analysis can be used in a city policy environment to pressure test a whole range of interventions (whether these be fiscal policies, something physical / technological, or different still in nature) in order to understand their likely resilience and/or sustainability (Redman, 2014; Collier *et al.*, 2013; Zhao *et al.*, 2013). Undoubtedly there will be iteration between each aspect moving steadily towards agreement of the best approach for a city. The ability to make any scenario possible requires a series of steps (milestones) within an overarching strategic **roadmap** which encompasses a shared understanding and buy-in, with long-term commitment, from within the city 'community' (in its broadest sense) and a deep understanding of the context in which the journey will take place. This will likely require detailed interrogation of the physical and economic feasibility (including required policy measures) for achieving a desirable future therein (Robinson, 1982; Robinson, 1990). The richness within all of this is the ability to initiate a meaningful conversation about the future from multiple perspectives leading to a multi-dimensional scenario, or scenarios, created through a participatory approach.

Building on an extensive monograph produced by the *Urban Futures* project team (appended to *Designing Resilient Cities* publication, Lombardi *et al.*, 2012), this paper provides a critical review of 'aspirational' scenario approaches, methodologies and toolkits reported in the literature and forms the basis of a much larger report on how scenarios might be used by cities to help them create policies and strategies to meet their own future city visions. This paper is written for the Foresight Futures of Cities project with the main aim of identifying key approaches, and providing comment on their usefulness and the skill levels needed to apply them when considering three broad categories of user:

- (a) citizens
- (b) practitioners with no specialist knowledge
- (c) academics and/or practitioners well-versed in the topic area

## 2.0 DERIVING CIY-BASED ‘ASPIRATIONAL SCENARIOS’

Hunt *et al.* (2012) produced a monograph (limited to the period 1997 to 2011) which systematically reviewed 110 different future studies (> 450 individual scenarios), this being the first essential step of the ‘Urban Futures’ research. The literature review found that whilst it might be suggested that there are many different processes for deriving future scenarios they consist broadly of 10 generic stages, as first proposed by Ratcliffe and Surr (2003) and shown in **Figure 2**. These were reported to have been adopted by an extensive range of Global and UK-specific audiences, for example the *Department for Transport* (DfT) 2006 and 2007, *Foresight* in 2008 and the *Local Government Association* (LGA) in 2008 (Hunt *et al.*, 2012).

By revisiting the literature and narrowing the focus to the development of aspirational scenarios (STEPS 1 to 6) it was found that these steps are still highly applicable. In aspirational scenario development STEPS 1 to 4 and 6 are identical for all methodologies considered. The main difference occurs when scenario logics are developed (STEP 5 – Section 2.5) where different scenarios are created, although even here synergies exist. In a city context STEPS 1 to 6 are now described.

## 2.1. STEP 1: Defining the Strategic Question(s) for Cities

In all approaches the fundamental starting point is to identify the strategic question(s) that must be considered. In the context of a future city these should necessarily be broad and allow for meaningful engagement from participants, for example:

*Q1 – How are transactions (i.e. physical and economic) achieved in the city?*

*Q2 – How is movement facilitated in the city?*

*Q3 – How are resources sourced, extracted and used within the city?*

*Q4 – What is the look and feel of the city like?*

When considering an ‘aspirational’ scenario the questions can be slightly rephrased to take into consideration how one would like these to be, or, conversely, to ask respondents to consider one overarching question:

*Q – What do you aspire to achieve in your city?*

Whatever the approach, this initial question helps inform an overarching vision which may conform to archetypal city visions that exist already (e.g. smart, innovative, liveable, resilient, sustainable) or may accommodate changing aspects of our current environment (Schwartz, 1991). In addition, ‘aspirational’ goals can be derived from deeply held beliefs and/or concerns (Hill *et al.*, 2014), or simply reflect preferences that are driven by underlying needs / wants, or reflect Jungian characteristics (Jung, 1981; Briggs Myers and MacCaulley, 1985; Hirsh, 1985; Quenk, 2000) that describe the personalities of those considered. Therefore some level of objectivity is required when dealing with ‘aspirational’. That said, without posing these initial question(s) the visioning process becomes much more difficult, particularly when working with city stakeholder groups.

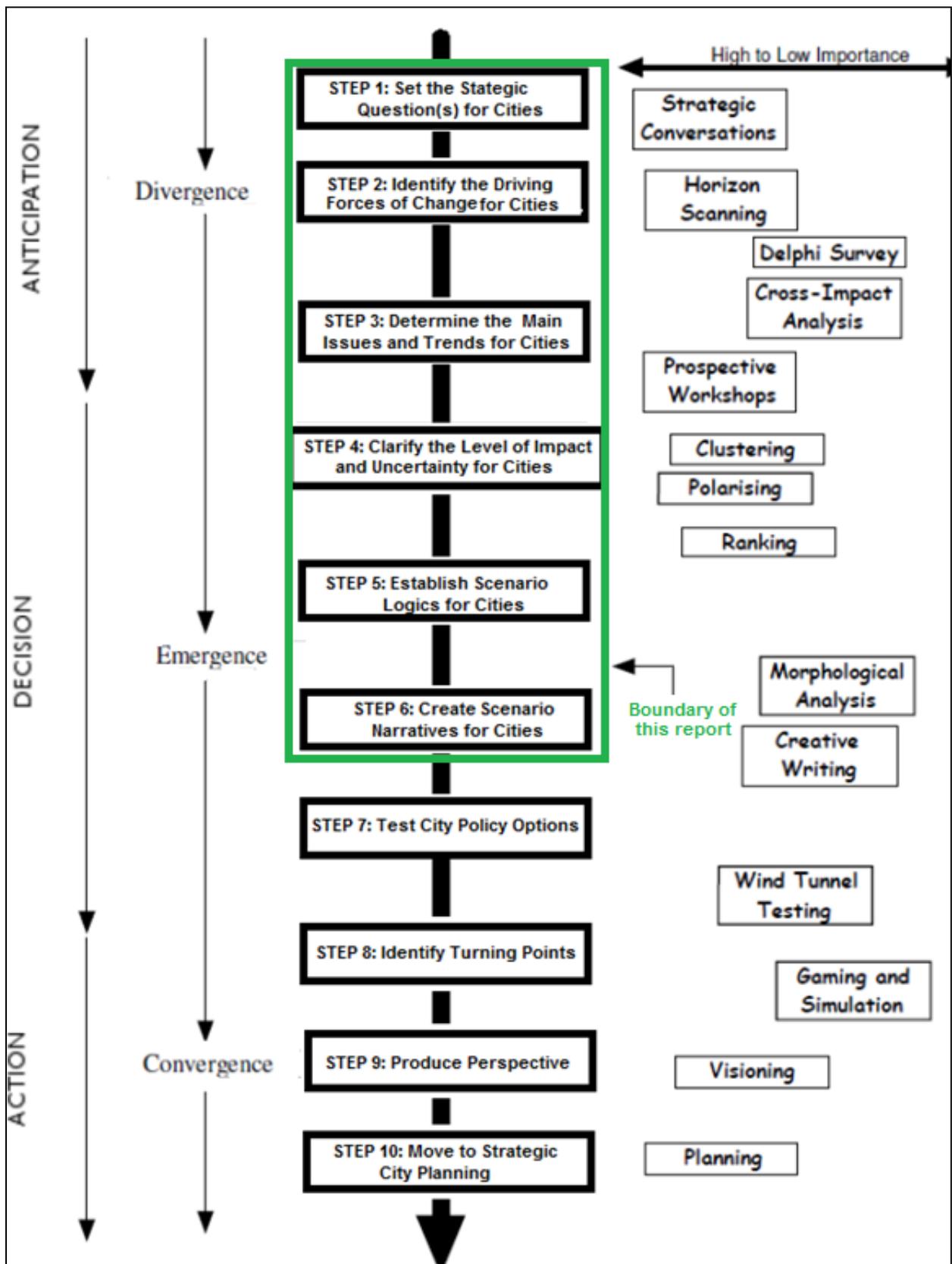


Figure 2. Prospective thinking through Scenarios (modified from Ratcliffe and Sirr, 2003)

The interesting point here relates to the positioning of the vision: at the end of the scenario development process in Figure 2 as opposed to the beginning of the process in Figure 1. Perhaps this merely emphasises that a vision is required to start the thinking process and ultimately it will/should be informed by and refined throughout these initial stages, and certainly before undertaking any strategic planning.

**SKILL LEVELS REQUIRED:**

**This step is eminently achievable by groups (a) to (c) and does not require specific skills to allow it to happen. A derivation of questions across these groups will identify aspects which are important to each. This diversity of questions enriches the process.**

## 2.2. STEP 2: Identifying Drivers of Change for Cities

The second stage is the process for identifying the driving forces of change within a city (highlighted by the green box in Figure 1). Whilst this is sometimes referred to as a methodology in its own right, the drivers of change form an underlying crucial element of horizon scanning and all scenario development. Within the scenario literature the most commonly adopted acronym is STEEPO (Hunt *et al.*, 2012) and this remains the case for ‘aspirational’ scenarios.

- S – Societal
- T – Technical
- E – Economic
- E – Environmental
- P – Political
- O – Organisational

Within certain disciplines, for example the water sector, the acronym PESTOR is used, where T is Technology and R is regulatory, while in other sectors O is sometimes accompanied by, or replaced with, L – Legal and E – Ethical, to yield STEEPLE. This configuration really depends on the motivational driving forces for that establishment.

### **SKILL LEVELS REQUIRED:**

**The skills required here are in translating each of the driver headings into sub-drivers that are applicable to a city or an individual/practitioner who lives/works therein. Whilst this might be readily apparent for groups (c) there will be a small amount of translation and/or reinterpretation for groups (a) and (b). A member of group (c) could facilitate this. With a city context in mind and as a good starting point for stakeholders, it would not be inappropriate to use of a list of drivers and indicators (already established or partially refined). In some cases this could draw from the past, looking at what key drivers have helped shape certain sectors of the city. For example, Pratt (2014), when reflecting on the last 50 years, identified five key drivers of change for the cultural field (i.e. Demographics, Technologies, Internationalisation, Organisation / Governance, Politics).**

### 2.3. STEP 3: Main Issues and Trends for Cities

This is a crucial step within the process of developing ‘future cities’ scenarios. A list of sub-drivers will be identified that influence the way the city is functioning or could function within the overarching STEEPO set. By necessity these should typically draw on two aspects:

- (A) Events which are ‘predetermined’ (e.g. *Demographics* – city populations will likely continue to increase according to some trend).
- (B) A range of critical ‘uncertainties’ (e.g. *Water Availability* – city water supplies will likely not be able to meet demands, or *Energy Prices* – city energy costs may be uncertain and volatile).

This is still required in a more ‘aspirational’ approach, although (A) and (B) become secondary to the underlying issue of what one would like to achieve within a city. In other words the future city vision might be one where ‘*all city dwellers have unfettered access to clean water*’ or ‘*all city dwellers have provision of energy that is affordable for all*’. These need not be mutually exclusive.

#### **SKILL LEVELS REQUIRED:**

**The skill set(s) required here is twofold, firstly to develop and then secondly to apply the survey (or facilitate the workshop). The latter can be conducted by anyone within group (a) to (c), although the former is best created through collaboration with group (c). The key requirement here is to establish a representative list of drivers from a range of city stakeholders. The survey should be developed to ensure that these drivers consider sufficiently aspects that meet both the requirements of and aspirations for the city and the individuals who live/work therein. One without the other very much limits the approach. Careful consideration is required to post-process the results in order determine whether drivers should be assigned as (A) or (B). This is more difficult, although not impossible to do, in a workshop setting as it requires a certain level of unpicking, in which case it is best achieved through facilitation by (a) well-versed individual(s) from within group (c).**

## 2.4. STEP 4: Clarifying the Level of Impact and Degree of Uncertainty for Cities

The next step adopted in both traditional scenario derivation and aspirational scenario development is to rank issues and trends (formulated from STEP 3) according to their:

- (C) Degree of uncertainty (i.e. likelihood of occurrence) within the set timeframe
- (D) Magnitude of impact

Figure 3 shows an example of how this has been done when considering STEEP sub-drivers within the wholesale markets. In this case demographic change is deemed to be of high importance but low uncertainty; energy prices are seen to be highly uncertain and highly important; and attitudes to management pay are considered to be of less importance and slight uncertainty. The important aspect here is to provide a structured approach to distilling drivers obtained from an initial survey to those which should be considered further for scenario development.

As there is some subjectivity involved here, the most appropriate methodology for sorting drivers into a hierarchical space is the Delphi survey technique. Therein, it is typical to adopt a follow on survey approach (WEF, 2008, 2010). In a city context individual city stakeholders would be asked to (exhaustively) undertake a pair-wise comparison of all city drivers taking into consideration both (C) and (D). Each individual would then be asked to answer pair-wise comparison questions for all drivers that have been identified in order to define a hierarchy of importance and uncertainty, for example:

Q. Is *'Demographics'* more (or less) important than *'Energy prices'* within the city?

Q. Is *'Demographics'* more (or less) uncertain than *'Energy prices'* within the city?

In the example shown 32 drivers would require 496 pair-wise comparisons to be made (248 for importance and the same for uncertainty). This reduces considerably if the driver list is much shorter:

- 4 drivers – requires 12 comparisons (i.e. 6 for each);
- 10 drivers – requires 110 comparisons (i.e. 55 for each).

Finally, the large initial driver set would be distilled down to a key set of drivers that are deemed to be most 'impacting' (in terms of uncertainty and importance) for a city, in this case those bounded by the dashed red line in the top right hand corner of the figure.

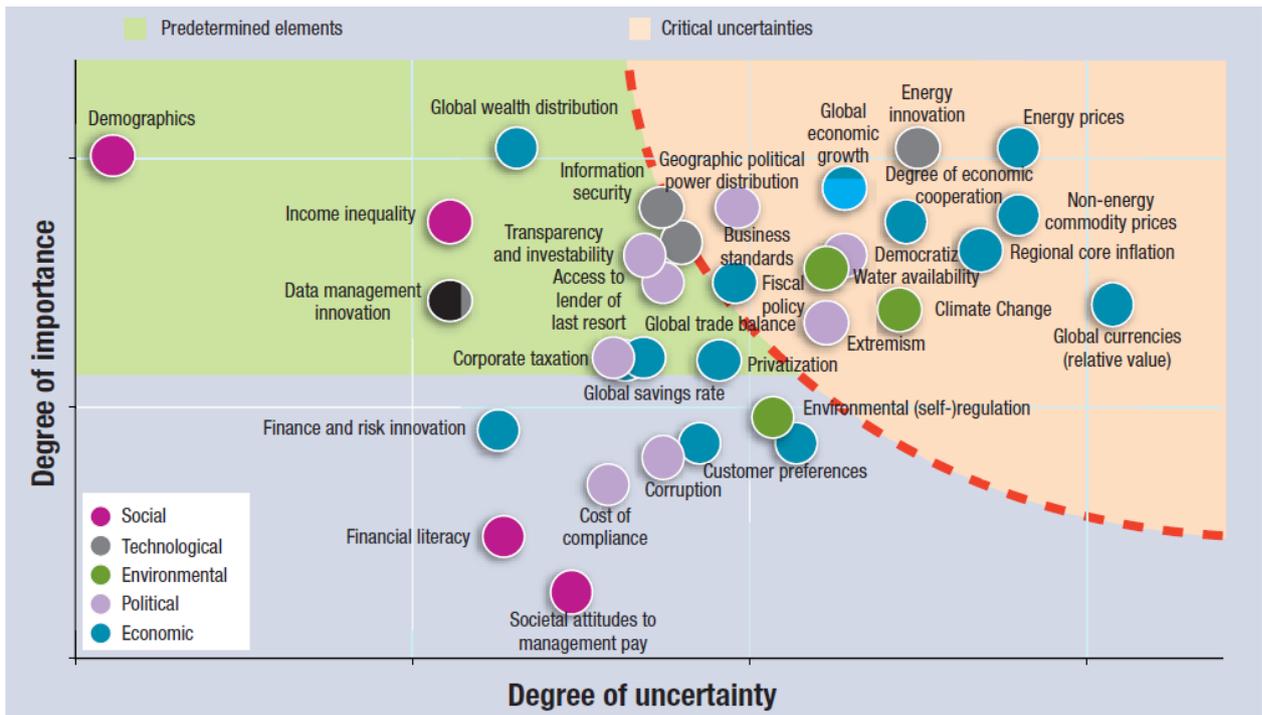


Figure 3. Prioritisation of key driving forces for wholesale markets (WEF, 2008)

**SKILL LEVELS REQUIRED:**

This step requires an individual (academic or practitioner) to subjectively place or objectively sort drivers according to the space defined by (C) and (D). As data collection is typically carried out through a follow up Delphi survey with individuals rather than with a group from within a workshop setting, this process is best undertaken by an individual well versed in the Delphi technique, i.e. those in group (c). The main shortfall is that the more drivers that are considered the longer the time required for an individual to complete a pair-wise analysis. For it to be robust it should consider a large cohort of respondents and in practice this may not be possible. One option is to let respondents bypass this step completely and merely pick key drivers from an already established list, such as that found in Hunt *et al.* (2012).

## 2.5. STEP 5: Establishing Scenario Logics for Cities

Once STEPS 1 to 4 have been undertaken, scenarios can be developed. Having reviewed the literature it becomes most apparent that this is the step in which fundamental differences to the scenarios approaches occur. This is very much to do with the way in which the scenario(s) themselves are developed. That said the one fundamental philosophy they all appear to share, and one which is therefore applicable to future city scenario development, is that no more than four should be adopted (Hunt *et al.*, 2012). This is particularly true if scenarios are to be well considered and critiqued, and especially so if this is to be done within workshop settings. Therein an additional important requirement is the development of a future history that makes sense (i.e. is logical) today – in other words it would not really make sense to consider an alien invasion, for example. Sections 2.5.1 to 2.5.7 outline some of the key features within seven approaches that are used to create this logic. The similarities and differences to the overarching approach outlined in Figure 2 are highlighted.

### 2.5.1 Axes of uncertainty or 'Drivers Matrix' approach

This approach was first referred to by Ogilvy (1995) and popularized by Schwartz (1991) in the publication 'The Art of the Long View'. As the most commonly adopted approach within the literature, it has been used for developing scenarios by many organisations within and outside the city (Hunt *et al.*, 2012). This includes UK Government (GO Science, 2009) and UK Foresight (OST, 2002, 2004, 2005, 2010). The methodology is straightforward, requiring two main drivers of uncertainty (Van der Heijden, 1997) selected from STEP 4 to be placed upon opposing axes with ranging scales. In terms of a city these might include, but are not limited to:

**SOCIETY** – Collective to Individualism

**TECHNOLOGICAL INNOVATION** – Rapid to Slow

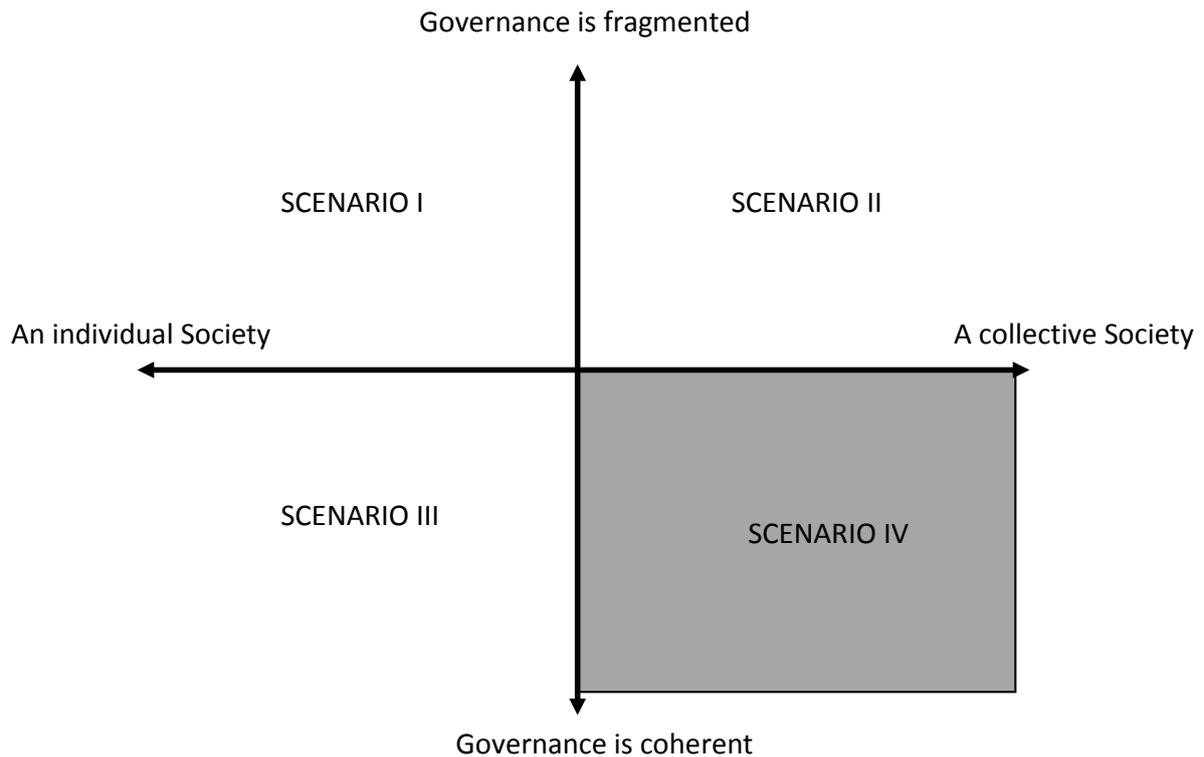
**ECONOMIC GROWTH** – High to Low

**ENVIRONMENTAL PROTECTION** – Strong to Weak

**GOVERNANCE** – ranging from Coherent to Fragmented

Alternatively it may adopt any of the list of >100 drivers that have been collated by Hunt *et al.* (2012). An example of this for a city could be the adoption of a Governance and Society driver, in which case four city scenarios would be developed (Figure 4), one of which, say Scenario IV, could be the preferential or what might be termed an 'aspirational' scenario, with the others being less desirable or non 'aspirational'. When considering the plethora of scenarios that have been derived through the axes of uncertainty approach (see Hunt *et al.*, 2012), it can be seen that more often than not there is a preferred scenario evident within the scenario set. Therefore this methodology could be used explicitly to develop an 'aspirational' scenario. Whilst the methodology has been criticised for creating simplified ideologies and worldviews (Schultz *et al.*, 2012), it is non-complex to apply by the user allowing for ease of understanding and buy in from a range of stakeholder groups (Hunt *et al.*, 2012). This is pertinent when considering its application within cities where both public and private sectors exist. Whilst it might be assumed that outcomes of using the axes of uncertainty approach might differ significantly between each sector this has been shown not to be the case, the main difference being that the process takes longer in the public domain than it does in the private (Ogilvy and Smith, 2004).

The main difficulty with this approach comes when trying to examine, critique and defend the scenarios. In many cases it is not done sufficiently well, most probably due to the fact that the axes do not have a scale. This is particularly true when trying to defend the placement of a series of worlds within the bounds of these axes in order to allow for more meaningful analysis (see for example Dti, 2002; Defra, 2007; de Vries, 2005; Duel *et al.*, 2010; Macropoulos *et al.*, 2009). The 'futures framework' approach applied to axes of uncertainty makes a concerted effort to address this by using a scale and a clearly defined contour space, which can then be interrogated when considering behaviour on one scale (much improved to worsened) and technological efficiency (much improved to significantly worsened) on the other (Hunt *et al.*, 2013).

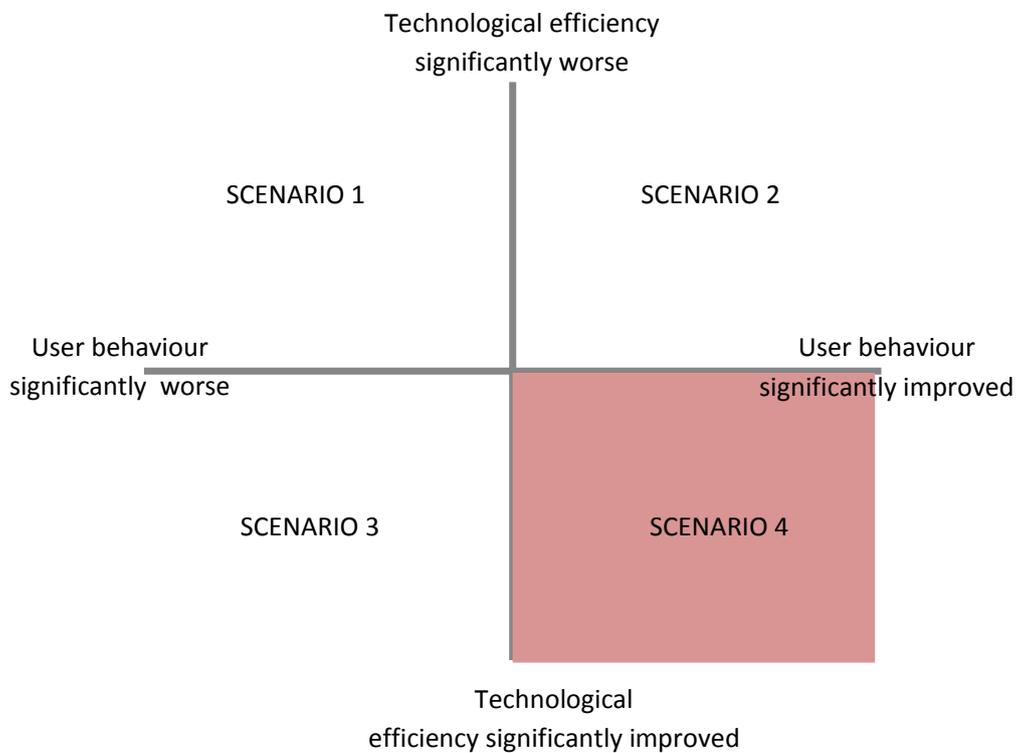


**Figure 4.** Axes of uncertainty considering Society and Governance, showing ‘Aspirational’ Scenario IV

This leads to four scenarios (Figure 5), one of which could be considered ‘aspirational’ – where highly efficient technology (e.g. smart instrumented and controlled water systems) is willingly adopted and users make a step change in improving their ‘user behaviour’ through taking actions which impact upon them (e.g. drastic reduction in shower time). The interesting point highlighted therein is that the same ‘aspirational’ outcome (e.g. reduction in consumption of a particular resource) could be achieved in Scenario 2, 3 and 4 (Zadeh *et al.*, 2014), but in a range of very different ways (Figure 6). Therefore when considering a city context it places a question against whether it is the scenario or the underlying goal that is ‘aspirational’. In some way therefore the three additional scenarios within the scenario set help to distinguish more clearly between that which is aspirational from that which is not.

**SKILL LEVELS REQUIRED:**

The process of forming and developing the scenarios with two axes is relatively straightforward and certainly something that groups (a) to (c) can undertake and should be involved in. The tricky part is defining those drivers which might be considered most important for a city. The major advantage of this approach is that a specific sub-driver can be investigated in depth. The major criticism is that the full complexity of city operations cannot (and should not) be distilled into two drivers within a single pair of axes, although this approach may be plausible (and advisable) when considering in detail individual aspects of a city environment (e.g. water use in the home).



**Figure 5.** Axes of uncertainty considering Technological Efficiency and User Behaviour, showing 'Aspirational' Scenario 4

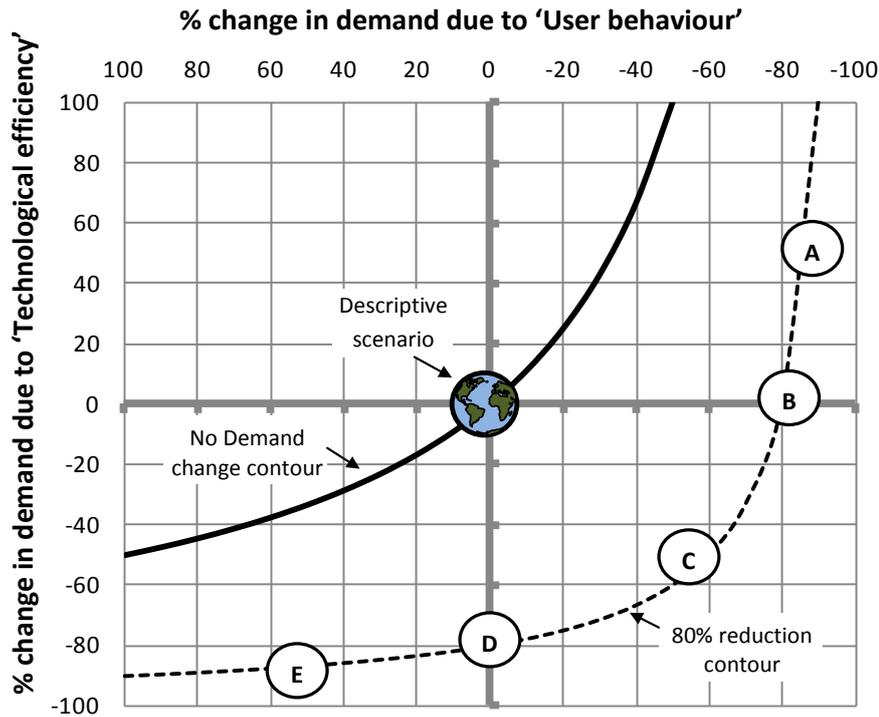


Figure 6. Futures Framework (Hunt *et al.*, 2013)

### 2.5.2. 'Success Scenario' approach

In 2010, ICSU (International College of Science) launched a Foresight consultation exercise as part of the planning for its six-year strategy, 2012-2017. The Foresight exercise focused on the organization and directions of international science in 2031 (the year of ICSU's centennial celebration) and was deliberately designed to explore a longer-term horizon beyond the immediate strategic planning period. It was done in two parts (ICSU, 2012):

Part 1: This initial stage consisted of a broad consultation with the scientific community, in particular ICSU's national and union members, to identify 'key drivers' (science and society) that would shape international science over the next two decades. These drivers were then used to develop four plausible exploratory scenarios using the axes of uncertainty approach with the following axes.

- Interest of states (Global to National)
- Outlook of Science (Detached to Engaged)

These would subsequently be used to explore how different factors may combine to influence the science landscape (ICSU, 2011).

Part 2: An initial draft of a success scenario, including its potential implications for ICSU, was produced at a facilitated workshop in April 2011 (~40 participants, including the ICSU Committee on Scientific Planning and Review, Officers, Regional Committee chairs and Secretariat staff). This was then refined after a series of consultations with the ICSU community (ICSU, 2011).

Part 3: As a final step, the success scenario was ‘road-tested’ against the **four exploratory scenarios** – a table that had been developed in Part 1, using the axes of uncertainty approach and which led to the identification of key challenges or tensions that ICSU was likely to face between 2010 and 2031, featured centrally in this analysis (ICSU, 2012).

**SKILL LEVELS REQUIRED:**

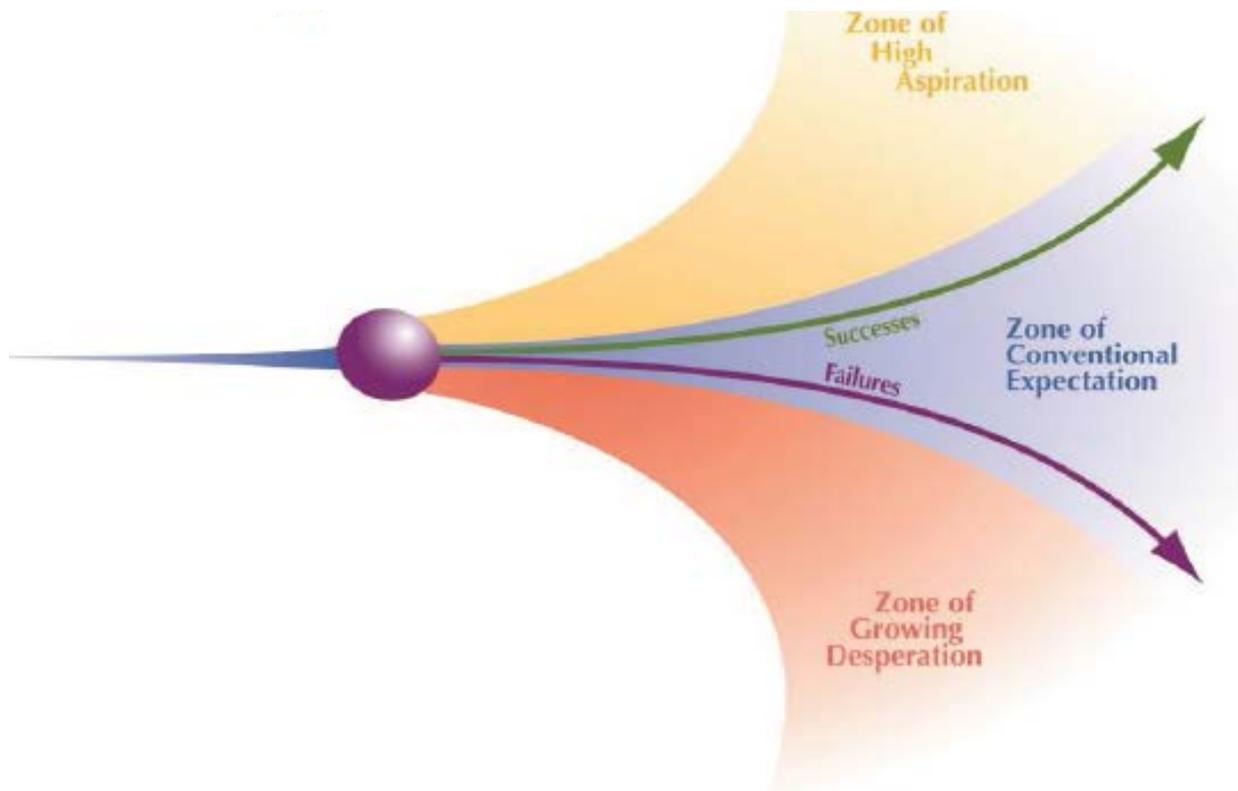
**The important aspect here is that the ‘axes of uncertainty’ approach was not only used to develop four exploratory scenarios, but also to develop and test an ‘aspirational’ scenario. This shows the richness and importance of providing contrasting story lines for the future which are both positive and negative. This is very much part of the scenario philosophy and has critical implications for city policy development.**

**The process was facilitated throughout by members of group (c).**

### *2.5.3 ‘Institute for Alternative Futures (IAF) – An Aspirational Futures’ approach*

Over the last 30 years the IAF has developed scenarios for a whole host of American organisations that reside within cities using what it calls an "aspirational futures" approach (Bezold, 2009a,b, 2010; IAF, 2015). Three different zones are required, as shown in Figure 7 and described below:

- **“Conventional expectation”** scenario – reflects the *‘world as we know it now and as we would expect it to be’* scenario – in other words the best guestimate (i.e. trend analysis) based on fundamental assumptions currently used by policy makers within the city.
- **“Zone of growing desperation”** scenario – reflects the *‘if it can go wrong it likely will’* scenario and is based on a list of major city challenges.
- **“High aspiration”** (typically two separate scenarios) describes visionary strategies leading to successful outcomes – they usually consist of high validity / low credibility scenarios based on western socio-economic paradigms (Markley, 2015).



**Figure 7.** Aspirational Scenarios (Markley, 2015)

The approach requires three phases for development of the scenarios (Markley, 2015; IEEE, 2013):

*Phase 1a:* Identifying key drivers of change to the operational environment (akin to STEP 2)

*Phase 1b:* Drivers distilled to a smaller group through an online survey (likely using Delphi techniques). For example, when considering advancing technology with IEEE, the IAF group selected 9 drivers from an initial group of 18, these were

- (1) Global Intelligent Networks;
- (2) Knowledge Creation and Dissemination;
- (3) Workforce;
- (4) Scientific Disciplines;
- (5) Intellectual Property;
- (6) Technologies and Generations;
- (7) Standards;
- (8) Conferences; and

(9) Energy.

*Phase 2a:* IAF then developed forecasts in the expectable zone for each of these nine drivers and these expectable forecasts were refined (considering ‘fears’ and ‘aspirations’) by IAF through conducted interviews. For IEEE this consisted of four members of the Board of Directors.

*Phase 2b:* The nine ‘*expectable forecasts*’ were used to prime those attending a scenario-building workshop designed and conducted by IAF. During the first part of this **workshop**, participants outlined one “*challenging*” and one “*aspirational*” scenario for each of the nine “*expectable*” forecasts. For the IEEE example, participants were the IEEE Ad Hoc Committee on Strategic Planning.

*Phase 2c:* The second phase of the **workshop** is used to create and rank (in terms of importance and urgency) a list of key strategic questions that should be considered (Akin to STEP 1 and 4).

*Phase 3:* In this last phase **scenario narratives** were developed by IAF, one of which is aspirational, the other highly aspirational (IEEE, 2013).

Whilst the method claims to be unique, there is very little difference to the overarching approach outlined in Figure 2. The advantage of the approach is that trend-based (objective) and subjective-based scenario development are used side-by-side, which in the context of this research would allow for multiple lenses to help shape city policy derivation. The main difference is related to when the strategic question is actually developed – in this case it is suggested this occurs after (rather than before) the key drivers have been found. The added advantage of doing it this way round is unclear.

This approach was used at a city scale to guide civic leaders of Charlotte on the sensitive subject of addressing racial tensions (Unknown, 2004). This followed the poor results from the measurement of social capital in 40 US cities in 2003. The process was presumably undertaken over a 12 to 15 month period (to both collect data and develop the scenario narratives). Six categories (sub-drivers), applicable to all cities, were considered:

- 1a. Demographic change – population growth and its impact on diversity
- 1b. Economy – growth, stagnation or decline
- 1c. Land use – smart growth or urban sprawl
- 1d. Public education – more segregation or more balance
- 1e. Civic Engagement – a decline or a rebound in participation
- 1f. Community resources and their allocation – more equitable access or a wider gap between rich and poor

Four scenario narratives of 1300 words each (‘*Fortress Charlotte*’ – worst case scenario, ‘*Class Act*’ – aspirational scenario, ‘*Eye to Eye*’ – aspirational scenario, ‘*And the Beat Goes On*’ – the muddling along scenario) were subsequently developed by a consultant (presumably IAF), shortened versions

of which can be found in the Appendix. These were made into short films which residents watch then break into smaller groups to discuss what they mean to them (Aycock, 2012). The interesting point here is that the sub-drivers are considered on scales not dissimilar to those adopted in the axes of uncertainty approach and the stories that are developed are not dissimilar to scenario archetypes (2.5.3). Thus there is much interconnectivity within these methods. The process has been adopted also to consider aspects of health within the USA (Unknown, 2004; IAF, 2011, 2012, 2014; IEEE, 2013; PHII, 2013). The relevant narratives can be found in the Appendix (Tables B to F).

**SKILL LEVELS REQUIRED:**

**As the IAF has developed and coined this as a unique approach, it would likely suggest that the process is best undertaken by them. However when we look at the approach we can see that it is relatively generic, not least in its use of STEPS 1 to 4 – the skill levels required therein having been previously discussed. The additional skills come in the form of the ability of individuals/institutions to gather/provide sufficient data, which can take considerable time and effort. Whilst the data are not used within the scenarios themselves, they it very much drive the initial discussion stages of the process. What is of most concern is that if it takes over 12 months to consider one aspect of city living, how long would it take, and is it actually possible, to consider in totality the complexities of all city operations? Whatever the case, the benefit of this approach is that it could provide cities with a set of scenarios that allow them to consider where they are, where they want to be and where they do not want to be. This has critical implications for policy making and the advantage that it allows for more meaningful discussions with civic groups. In addition it allows one scenario to inform the development of the other through an iterative type of approach.**

#### *2.5.4 Scenario Archetypes*

In general scenario development for the longer term is about the (far) future and in most cases considers foresight devoid of any requirement to consider hindsight. However this should not be ignored when considering historical ways in which society and our cities have responded to contextual stress (Galtung and Inayatullah, 1997). This is important as it gives clues to how current and future city responses, some more aspirational than others, and policy requirements might take shape. Dator (2002) argues that four ‘historical archetypes’ exist across history in a range of geographical/cultural settings:

- Business as usual – a society that continues on the same path
- Disciplined – a society stabilised by ideological values
- Transformational – a highly transformative society beyond what we know and do now
- Collapse – a less hopeful societal failure

Interestingly when considering futures literature it has been shown by a number of authors that a set of future scenario archetypes exist (Raskin, 2005; Inayatullah, 2008; Inayatullah *et al.*, 2009; Bezold, 2009a; Hunt *et al.*, 2012). These map exactly onto those shown above and belong to a scenario set initially described by the Global Scenarios Group in 1997 (Table 1):

**Table 1.** Four archetypal social visions for the future, adapted from Gallopín and Rijsberman (1997).

<b>World End-State</b>	<b>Scenario Variants</b>	<b>Archetypal Social Visions</b>
<b>'Conventional'</b>	Market Forces (MF)	A world that evolves gradually, shaped by dominant driving forces
	Policy Reform (PR)	A world that is influenced by a strong policy push for sustainability
<b>'Great Transitions'</b>	New Sustainability Paradigm (NSP)	A world where new human values and new approaches to development emerge
	Eco-Communalism (EC)	
<b>'Barbarization'</b>	Fortress World (FW)	A world that succumbs to fragmentation, environmental collapse, and institutional failure
	Breakdown (B)	

One option is to use these scenarios directly rather than developing new ones, as has been done by so many other institutions. This has been done with success for cities by the *Urban Futures* research team, although very much in the context of testing the resilience of interventions adopted in the name of sustainability (Lombardi *et al.*, 2012). A policy intervention in that sense could be appropriate. In terms of an 'aspirational' scenario the 'Great Transitions' archetype might be deemed as wholly applicable.

**SKILL LEVELS REQUIRED:**

**Adopting an existing aspirational scenario has a considerable advantage in terms of time saved for developing a new scenario set and therefore could be easily applied by groups (a) through (c). Whilst the scenarios would help initiate conversations about the future aspirations for a city, these scenario narratives would need to be refined taking into account a city rather than world context.**

**In many ways the same archetypes have been continuously adopted (unknowingly) by a plethora of city-based establishments (Energy, Water, Transport, Healthcare, Education, Land Use Planning), with refined narratives being provided that take into consideration the local context, priorities and conditions.**

**Even when considering the IAF approach (Section 2.5.3), identifiable links with the overarching set of archetypes listed in Table 1 are self-evident.**

### 2.5.5. Royal Institute of British Architects – RIBA approach

The six city-based scenarios (See Table 2) produced by RIBA (2013) concern the third age and are badged as ‘positive’ rather than ‘aspirational’. The process for their derivation is not clearly described although it is, as other approaches, based on a fundamental question – in this case: *How could our ageing population shape our city?* As with other approaches, the scenarios formulated therein followed public debate, expert roundtables and research discussions conducted by Building Futures.

**Table 2.** Six Aspirational Scenarios of the Third Age

Scenario	Brief Narrative
<b>1 - Members’ Club Mansion Block: A New Urban Lifestyle</b>	An International network of residences REPLACES home ownership, balancing privacy with sociability and liberating Third-Agers to explore the world in style
<b>2 - Reinventing the Family Home</b>	An increase in multi-generational living has begun to shape new accommodation, offering independence for, and co-dependence between, Third-Agers and their families
<b>3 - The High Street Revived</b>	The active Third Age have reclaimed the high street, acting as a catalyst for new public amenity, private enterprise and intergenerational exchange to complement existing retail
<b>4 - Seaside Enterprise Zones: A New Local Economy</b>	Flexible work, leisure and living opportunities for Third-Agers have attracted investment to kick start coastal towns
<b>5- City Networks: The Pop-Up University</b>	The city has become a university, utilising existing infrastructure to support learning and skill sharing between generations
<b>6 - City Networks: Healthy Infrastructure</b>	A network of Third-Age health hubs, connected by routes promoting exercise in public spaces, now encourage active ageing and wellbeing in the city

#### **SKILL LEVELS REQUIRED:**

The approach taken by RIBA is applicable for citizens (a) and practitioners (b) to undertake, since a two-pronged driver of change (socio-economic – demographics) is chosen from the outset, essentially bypassing STEPS 2 to 4. Once again this approach highlights the need to seek citizens’ views – in this case to help define and shape what type of positive contribution the older generation could play. In addition it perhaps shows the advantage of adopting scenarios at a range of scales all equally applicable to cities (i.e. the home, the neighbourhood, the town and the wider urban and international networks).

### 2.5.6. 'Plan 2035'

In developing Plan 2035, NJTPA (North Jersey Transportation Planning Authority) worked with a wide range of citizens, elected officials, interest groups, government agencies and other stakeholders, as well as nationally-recognized experts on key issues related to city transportation planning in North Jersey. Outreach came in the form of:

- A kick off symposium
- Roundtables, each focussing on key themes (e.g. climate change)
- Hands-on multiple local visioning workshops (of 10 to 50 people)
- A webpage and an online survey (10 questions – such as: *what direction is the region heading in the next 25 years?* – and 350 respondents)

In all, nearly a 1000 people voiced their opinions about how to improve transportation in the region and address the challenges of an uncertain future. The extensive outreach helped shape the NJTPA's technical analysis of issues facing the region, including guiding the development of three future scenarios that underwent computer modelling (NJTPA, 2010):

- A 'Baseline Scenario' that continues current trends and carries forward current funding levels
- A 'Plan 2035 Scenario' that includes funding increases and changes to regional land use to emphasize smart growth
- An 'Aspirational Scenario' with substantial funding increases and more extensive land use changes

#### **SKILL LEVELS REQUIRED:**

**The important element to take away here is that 'aspirational' scenarios were drawn out based on recurring themes identified through 'visioning' workshops and through extensive outreach. The process is not dissimilar to that used by IAF, excepting that a worse-case scenario is not considered. The process was run by in-house staff at NJTPA which is very much akin to group (b). Group (a) have considerable impact upon the process, but do not drive it.**

## 2.6. STEP 6: Creating Scenario Narratives for Cities

This step involves story writing (i.e. the bringing together of ideas to convey a coherent story line) for each of the scenarios being developed. It marks the point at which policy options can be tested against each scenario.

### **SKILL LEVELS REQUIRED:**

**Articulation and creation of the scenario narrative(s) requires an individual who is good at writing narratives rather than an individual well versed at futures analysis. Even those who reside in group (c) may be well versed in all of the techniques, but may not have these story-writing skills – in which case an outside talent may be required (and perhaps is advisable) for this purpose. A considerable skill set is required for ensuring some level of internal consistency within scenario narrative development and it is not always made clear by authors if and how this has been done. The fact that scenarios could/should act as a filter to ‘wind tunnel’ test (or develop) policies (STEP 7 – not considered here) is a fundamental reason why a scenario set should not be limited to ‘aspirational’ scenarios alone.**

### 3.0. CONCLUDING DISCUSSION

By reviewing the literature to identify and critique methodologies for creating aspirational scenarios, it was found that six clearly identifiable steps were shared by all the methodologies reviewed. These were:

STEP 1 – Define the strategic question that you wish to look at

STEP 2 – Identify drivers of change therein (which should be necessarily broad accounting for the breadth of city processes)

STEP 3 – Sort them according to those which are predetermined and those which are critical

STEP 4 – Further identify the level of impact and degree of uncertainty in order that a hierarchy can be determined and a much smaller set of drivers (with high uncertainty and high impact) can be considered

STEP 5 – Define the scenario logics considering critical key drivers of change in order that narratives can be drawn up (i.e. STEP 6)

STEP 6 – Create the narrative for the scenario

STEPS 1 to 4 and 6 were indistinguishable from each method considered, the only differences, albeit relatively small, manifest themselves in STEP 4 where drivers are either considered as a larger multiple set (i.e. 5 or more) allowing breadth of research (i.e. Scenario Archetypes, IAF, Success Scenario, Plan 2035) or restricted to two key drivers of change (i.e. Axis of Uncertainty, RIBA) allowing for depth of research. Each approach has its advantages and disadvantages which can complement each other when used in combination. The differences in the approaches occur in STEP 5, where the scenario logics are drawn up. However, even here striking similarities exist – for example, all studies recommend using four scenarios, with at least: one aspirational (or preferred), one baseline (or business-as-usual) and one worst case (or least preferred). This is important since, as Ogilvy (2011) points out, an aspirational scenario when used alone may well allow for city optimism and utopian thinking to be engaged, but for it to be most effective (when making policy choices) it very much requires cognisance and clear-eyed recognition that plans can misfire. This is why the baseline and less optimistic scenarios are essential in order that true policy resilience can be considered and unwanted futures more easily avoided, or at the very least considered. The point in all of this has to be that the conversation is initiated in order that city policy makers can use scenarios as a filter through which to pass (and test) policy options.

The skill sets required for each of these steps depends upon the complexity of the work to be undertaken and, whilst citizens are very much partakers in the process in STEPS 1 and 2, they may struggle (unless well versed in the concepts) to conduct the background processes for STEPS 3 and 4 (e.g. using Delphi). Nevertheless a wide stakeholder group, ranging from citizens to key decision makers, is used at different stages in the development process for aspirational scenarios: large stakeholder groups in the early stages through workshops to capture breadth, then a small stakeholder group at the later stages to refine drivers and develop scenario logics, thereby adding depth. The skillset for writing the short narratives typically requires outside writers, with the most important aspect being to ensure that the scenarios themselves have a level of internal consistency.

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## APPENDIX 1 – EXAMPLES OF ASPIRATIONAL SCENARIO NARRATIVE SETS

**Table A:** An Aspirational ‘Success’ Scenario for International Science in 2031 (ICSU, 2012).

Scenario	Narrative - <i>N.B. Text is taken directly from source material without editing or paraphrasing.</i>
<b>1: A Success Scenario</b>	<p>It is 2031 and international scientific research is making significant inroads into tackling the global environmental and societal challenges that two decades earlier were threatening the future sustainability of the planet. The delays in achieving binding international agreements on reducing emissions and managing natural resources, mostly due to fear of economic consequences, have led to increasing reliance on science and technology to come up with efficient and affordable solutions. Science is universally valued and has played a leading role in the development of a fairer and more equitable global knowledge society. The continued rapid evolution of information and communication technologies, enabling full and open access to scientific information and data, has been instrumental. The scientific promise of countries such as China, India and Brazil, as well as South Africa and several of the ‘Asian tigers’ has been realized and, whilst the OECD countries are less predominant, they have largely maintained their historical strengths. Science policies and investment from foreign donors and national governments have led to the creation of centres of scientific excellence and strong scientific networks in regions and countries where science was previously neglected. International networks of cities, bringing together policy makers and academics, have developed around common challenges. These new centres and networks are playing an active part in coordinated global research initiatives that are providing technological solutions and policy options in areas such as climate change, disaster risk reduction, food, water and energy security, population growth, ageing and health. The historical divide between natural and social sciences has been overcome and different perspectives have been successfully integrated in a problem oriented approach to tackling global challenges. At the same time the traditional science disciplines have continued to evolve and new discoveries in fundamental science have attracted new generations of scientists and led to technological breakthroughs in areas such as energy, agriculture and medical care. In many of these areas, innovative public-private partnerships have enabled the development and adoption of beneficial technologies - even in countries where the immediate market benefits were limited. Earlier societal fears about the dangers of nanotechnologies and genetic engineering have proven to be largely ill-founded; this was assisted by the implementation of effective international regulations and standards with the support of enlightened industrial leaders. Trust in science has also been strengthened by a major international campaign, led by science institutions, to promote research integrity and address scientific misconduct. The relationship between science and the public has been positively influenced by changes in the teaching of science and, in particular, the engagement of active research scientists at all levels of education. Improved scientific literacy has benefitted from the full exploitation of Information and Communication Technologies and multi-media tools to communicate science and promote public engagement. In a world that is appreciative of science and in which scientists are sensitive to the needs of society, young people are attracted to scientific careers and funding for science has increased almost universally. Over the past two decades, ICSU, its Members and programmes, have all played a significant role in strengthening international science for the benefit of society.</p>

**Table B:** Vulnerability 2030: Scenarios on Vulnerability in the United States (IAF, 2011)

Scenario	Narrative - <i>N.B. Text is taken directly from source material without editing or paraphrasing.</i>
<b>1: Comeback</b>	<i>Expectable zone</i> - The economy rebounds after the Great Recession. Education improves and works for most families. But automation and offshoring prevent many jobs from ever coming back. Governments are constrained by their debts. Despite some improvements, the ranks of the vulnerable expand.
<b>2: Dark Decades</b>	<i>Challenging Zone</i> - The double-dip recession is followed by Peak Oil in 2016. Prices for energy and food rise rapidly while low- and middle-income jobs continue to disappear. Government services and payments are cut severely, while vulnerability rises significantly.
<b>3: Equitable Economy</b>	<i>Aspirational Zone</i> - A Depression follows the Great Recession. Massive unemployment and hardship prompt a shift in values that leads to an economy that is fair and works for all. Governments are forced to be effective and education works for all. Vulnerability is reduced.
<b>4: Creative communities</b>	<i>Aspirational Zone</i> - The economy recovers. High debt levels limit what federal and state governments can do. Families and communities become more self-reliant and creative in finding solutions to their problems, creating local currencies, barter services, supports for local innovation, and invigorated processes for community engagement. Technology yields low-cost energy and food, as well as a capacity for localized manufacturing of many daily necessities. Vulnerability is reduced.

**Table C:** Health and Healthcare in 2032: RWJF Futures Symposium (IAF, 2012)

Scenario	Narrative - <i>N.B. Text is taken directly from source material without editing or paraphrasing.</i>
<b>1: Slow Reform, Better Health</b>	<i>“zone of conventional expectation”</i> - Health and effectiveness of health care vary among states. Health, not health care, becomes the main political issue. Communities address social determinants of health, prevention and population health while enacting “health in all policies.” Self-care and health knowledge reduce demand for medical care and are enhanced through risk behavior management, social networks, digital technologies, pre-disease identification, data and new cures and therapies.
<b>2: Health If You Can Get It</b>	<i>“zone of growing desperation”</i> - Medicare and Medicaid experience severe budget cuts, most Americans are underinsured, medical tourism increases, epidemics spread and health and inequality worsen. The primary care physician shortage hurts community health centers, which struggle to treat many new patients who otherwise visit unreliable fee-for-service minute clinics. The public becomes highly fractured and disillusioned with the ineffectiveness of governance.
<b>3: Big Data, Big Health Gains</b>	<i>“zone of high aspiration”</i> - Health becomes the primary concern. Initiatives regarding health innovation, health equity, the social determinants of health and health in all policies reduce health care expenditures. The public demands anticipatory democracy, cooperation, sustainability and transparency. Innovative technologies, “big data,” and knowledge transform manufacturing, the economy and health, yielding cures for Alzheimer’s disease, effective management of cancers and widespread implementation of personalized medicine and health avatars.
<b>4: A Culture of Health</b>	<i>“zone of high aspiration”</i> - Leaders create environments to support and improve all domains of health as a “health culture” arises. The nation’s focus shifts to disenfranchised youth, and to the development and comprehensive health for children. Health care spending is capped. Avatars, enhanced self-care and transparency in health education and medical knowledge all reduce demand for medical interventions. “Health wisdom” expands as social networks “crowd source” health. Environmental monitoring is widely implemented among communities.

**Table D:** Exploratory Scenarios for International Science in 2031 (IEEE, 2013).

Scenario	Narrative - <i>N.B. Text is taken directly from source material without editing or paraphrasing.</i>
<b>1: Smart Technologies, Missed Opportunities</b>	<i>Expectable zone</i> - The combination of big data and social networks creates high-quality knowledge technologies and networks around the world. However, leaders and communities fail to use them to address the grand challenges of the 21st century.
<b>2: Info, Info Everywhere (and Not a Drop to Drink)</b>	<i>Challenging Zone</i> - A small number of powerful entities create and control advanced analytics that turn information into knowledge. Most people lack access to these sophisticated tools for making sense of the ever-increasing reams of information.
<b>3: An Integrated Knowledge Network</b>	<i>Aspirational Zone</i> - Visionary leaders facilitate the creation of a highly integrated global knowledge network that is accessible to all. The network combines advanced analytics and human expertise to create high-quality knowledge, and increasingly wisdom, for alleviating global challenges.
<b>4: Distributed Talent for Good</b>	<i>Aspirational Zone</i> - Rising unemployment and shifts in societal expectations undermine traditional organizational structures, pushing most associations and many other organizations to the brink of extinction. However, a handful of these associations reinvent themselves as networks of autonomous entities united by a common purpose.

**Table E:** Public Health Scenarios in 2030: RWJF Futures Symposium (IAF, 2014)

Scenario	Narrative - <i>N.B. Text is taken directly from source material without editing or paraphrasing.</i>
<b>1: One Step Forward, Half a Step Back</b>	<i>“zone of conventional expectation”</i> - Amidst continued fiscal constraints, public health agencies and health care slowly advance their capabilities. Many use automation and advanced analytics to improve services and community and population health. However, climate change challenges continue to grow, and there is little progress in improving the social determinants of health. Great variations in technological capabilities, funding, and approaches to prevention – along with a continuous rise in health care costs – significantly limit public health gains
<b>2: Overwhelmed, Under-Resourced</b>	<i>“zone of growing desperation”</i> - Funding cuts and a hostile political context undermine the role of public health agencies, which subsequently fail to attract talented young people. Public health crises grow worse and more frequent, largely due to climate change. Private sector initiatives produce significant innovations for health and wellness, but these primarily benefit the middle-class and affluent groups. Technological, economic, educational, and health disparities grow, and the institutions of public health have little capacity for doing anything about them.
<b>3: Sea Change for Health Equity</b>	<i>“zone of high aspiration”</i> - National and local economies gradually grow, and changes in values and demographics lead to “common sense” policies and support for health equity. Public health agencies develop into health development agencies that use advanced analytics, gamification, and diverse partnerships to identify problems and opportunities, and catalyze and incentivize action to improve community health. While some disparities persist, in 2030 the vast majority of U.S. residents have attained greater opportunity for good health through quality improvements in housing, economic opportunity, education, and other social determinants of health.
<b>4: Community-Driven Health and Equity</b>	<i>“zone of high aspiration”</i> - Public health agencies, partners, and local health improvement initiatives coalesce via technology and social media into a national web of community health enhancing networks. These networks help communities exchange their innovations and best practices, and leverage the expertise of public health agencies and others. The nation also strives to come to terms with its racial and socioeconomic histories, and supports real changes and legislation to create a more equitable society. This value shift to equity is accelerated by the proliferation of new community economic models that help households sustain themselves and improve health and wellbeing. Public health sheds many functions and facilitates these movements to improved health.

**Table F.** Public Health Informatics 2023: Alternative Scenarios (PHII, 2013)

Scenario	Narrative - <i>N.B. Text is taken directly from source material without editing or paraphrasing.</i>
<b>1: Information for Health Action</b>	<p><i>Zone of Conventional Expectation</i> - Over the years up to 2023, constrained economic circumstances— in conjunction with health departments’ role in prevention and supporting national security—drive up the demand for a more strategic public health. While PHAs (both state- and local health departments) continue to do “what others cannot or will not do” to enhance the opportunities for all to be healthy, most shift away from the delivery of clinical health care services and enhance their assessment, protection, and prevention efforts. Yet challenges with funding, resources, data quality, and actionable analytics in the face of rising chronic disease and climate change have an impact on the full promise of public health and PHI. By 2023, the aggregate health of the nation has improved only marginally.</p>
<b>2: Write-Only Misinformatics</b>	<p><i>Zone of growing depression</i> - In 2023, informatics in public health is in a dire state. Severe economic decline has led to drastic cuts in federal, state, and local funding for public health and PHI. The Second Great Depression has hindered the nation from implementing crucial elements of the Patient Protection and Affordable Care Act, including effective uptake and use of EHRs and other health IT. Many PHAs (which include both state- and local health departments), have failed to keep up with advances in information systems, and still use outdated methods of collecting and analyzing data that do not meet demands for real-time information. An internal culture of ownership over data (the adage that data is spelled “TURF”) prevents many PHAs from sharing data externally and internally. This prevents PHAs from partnering with the private sector, which has more advanced informatics capacities and greater collections of health data. Many local health departments (LHDs) and some state health departments have been unable to expand or obtain the necessary informatics skill set shifts within their workforce. By 2023, many PHAs have become largely irrelevant when it comes to population health information, due to public distrust, restrictions in cloud computing services, a fast-shrinking workforce of public health informaticians, silos within PHAs, lack of funding, and lack of interoperability among surveillance and other information systems.</p>

Scenario	Narrative - <i>N.B. Text is taken directly from source material without editing or paraphrasing.</i>
<b>3: Pearl Harbour for Public Health</b>	<p><i>Zone of High Aspiration</i> - Public health and PHI quickly evolved into a federated enterprise over the decade thanks to a series of crises that public health helped prepare for and respond to. The “Pearl Harbor for Public Health,” a pandemic that got wildly out of control, set up public health to lead more effectively in future pandemics. Beyond the emergencies, as the availability of personal biomonitors, medical, environmental risk, and population health information grew exponentially, public health continued to evolve away from providing personal health care services to having a major role in the aggregation and analysis of population health data and setting health policy. As more information was routinely gathered and analyzed by health care providers, citizen science groups, and marketing companies, PHAs (which include both state- and local health departments) provided advice on analysis and provided leadership in collaboratively addressing the social determinants of health.</p>
<b>4: Everybody is an Informatician</b>	<p><i>Zone of High Aspiration</i> - In 2023, public health focuses on prevention of unhealthy conditions and creation of optimal health conditions, ranging across factors such as the social determinants of health, genomics, epigenetics, disease, predisease, nutrition, health care, behavior, and the ever-changing built and natural environments. PHAs (both state- and local health departments), and public health informaticians have proven almost too effective for their own good. Health care reform proved highly successful, as the United States economy gradually recovered from the recession period of the mid- and late 2010s. However, budget deficits required financial accountability and cost-effectiveness. While ACOs sought to reduce costs and improve outcomes of health care throughout the 2010s, PHAs in the late 2010s were required to implement an evidence- and experience-based minimum package of services and capabilities that included advocacy, partnership formation, and communication. To this end, PHAs worked with various community organizations and agencies to help people understand, access, and use the information that was gathered by individuals, citizen science, private organizations, and governmental groups. In 2023, PHI is no longer just within the realm of health departments. Accreditation standards require that PHAs demonstrate significant capacity in informatics and that they have informatics plans based on a national set of standards, yet private actors, consumers, and even schoolchildren have begun to use public health information to improve health. Public health information use has become a widespread societal capacity and is enabling some communities to pursue the revolutionary concept of “universal public health.”</p>

**Table G:** Scenarios for Racial Tension in Charlotte in 2014 (Unknown, 2004)

Scenario	Narrative - <i>N.B. Text is taken directly from source material without editing or paraphrasing.</i>
<b>“And the Beat Goes On”</b>	<i>The muddling along scenario</i> - Manufacturing jobs continue to be lost, replaced by low-paying service jobs, and economic growth is uneven. While some improvements in mass transit have been made, sprawl continues in many directions. Inner city development tends towards high-priced gentrification of select neighbourhoods as opposed to much-needed revitalization of poorer neighbourhoods. “It’s one of the two scenarios we want to move away from,” English says. “We’ve had people of colour say this one frightens them the most of all. ‘Same old, same old’ just isn’t good enough.”
<b>“Fortress Charlotte”</b>	<i>The worst-case scenario</i> - A widening gap between rich and poor has accelerated white flight to the suburbs, leaving the inner city with empty buildings and classrooms filled with the children of the working poor and middle class. The unemployment rate has risen to 10%. Funding for the arts and other cultural programs has been cut to maintain basic city services. Distrust, polarization and gang activity are on the rise while civic engagement continues to decline. “When most people hear this scenario,” English notes, “they say there are elements of Fortress Charlotte in existence right now, and that’s what I think is so powerful about it. It adds a high degree of urgency to this work.”
<b>“Class Act”</b>	<i>First aspirational scenario</i> - In this hopeful vision of the future the region’s economy is thriving and unemployment has dropped to 3%. Thanks to inner city revitalization, sprawl is under control. The quality of public education has improved because people of all colours are investing in the system together. Civic engagement and trust between races and ethnic groups is up. The only troubling thing about this scenario, English says, is that “it doesn’t offer a clear sense of how it’s all going to happen.”
<b>“Eye to Eye”</b>	<i>Second aspirational scenario</i> - Thanks to an alliance among communities of colour that formed in 2006, the balance of power in the region has shifted, and a more equitable distribution of jobs and resources has resulted. A more diverse, inclusive Charlotte has emerged, attracting talented people from far and wide. “Medical facilities, law practices, restaurants, bars and retail stores are opening in areas that were previously devoid of such services,” the scenario writers report. “A nascent, virtuous cycle is beginning to form.” Adds English, “In this scenario, people of colour and those who have been marginalized intentionally invest themselves in making the community stronger, better, and more accessible.”