



9.0 FURTHER COMMENTARY

Infrastructure Implications

Practical Application of the Urban Structure
Framework Plan

9.1 INFRASTRUCTURE IMPLICATIONS

Infrastructure is one of the areas that demands especially careful attention as Abu Dhabi grows rapidly over the next quarter of a century. While this Urban Structure Framework Plan has not included detailed infrastructure planning within its scope, a consciousness about infrastructure conditions and needs has informed the Plan. The purpose of this section is to summarize the upcoming challenge of infrastructure as this Plan is pursued.

Advanced, reliable infrastructures are absolutely fundamental to fostering rapid economic development. Since infrastructures manage the flows of energy, water and waste in the urban system, they are also absolutely fundamental to sustaining the delicate ecology of the city's environs. The current infrastructure capacity will not meet the forecasted demand and the resulting development envisioned in this Urban Structure Framework Plan. Clearly, new supply options must be determined, designed, funded and implemented as soon as possible.

There are also many measures that can be taken on the demand side that can make supply more effective. District cooling and resource recovery both have enormous potential to reduce peak load, as does encouraging conservation by consumers via numerous available strategies.

Infrastructure, like transit, can be used to focus and guide development. In many cases, it is a precondition to development. It is essential to ensure that Abu Dhabi's demand for infrastructure remains within reach of supply

A Sustainable Approach to the Future

Reducing energy and water consumption is essential. The following should be considered to achieve this:

- Building regulations and development codes that promote or legislate for greater resource-use efficiency in new developments;
- The use of TSE for toilet flushing and for the cooling tower make-up water in district cooling systems;
- Reduced irrigation water demands;
- Solve hot water heating and photovoltaic electricity generation at the domestic level, where practical, to reduce main electricity demand, especially peak demand;
- Reduced cooling loads from developments;
- Use of gas-fired, rather than electrically powered district cooling;

Further Commentary

Plan Abu Dhabi 2030 Urban Structure Framework Plan

- The promotion of sustainable development principles in all future developments; and,
- Reduced or abolished subsidy of the water and electricity tariffs.

It is suggested that Abu Dhabi develop a set of Sustainability Principles that apply to all future development. These principles should ensure the following in future development (not an exhaustive list):

- Reduced car travel per capita through more localized provision of services including schools, workplaces, and shopping.
- Reduced resource use per capita through greater efficiency of use, not through a reduction in level of service.
- Maximized use of microclimatic effects to enhance external thermal comfort.
- Maximized water efficiency and reduced water consumption across a development.
- Maximized energy efficiency and reduced carbon emissions across a development.
- New areas of high quality public realm to attract pedestrian use.
- Minimized impacts on existing businesses and residents of the area who will be displaced as a result of a development.
- Social inclusion and provision of a range of tenures within a development to accommodate employees of businesses in the new district.
- Sustainable waste management through the implementation of a Waste and Resources Strategy in a development.
- A procurement policy that specifies products and materials with high-sustainability performance from local sources wherever feasible.

Abu Dhabi, like most cities, is experiencing a “heat island effect”. Microclimate design can be very helpful. Climatically-responsive design can increase the amount of time that it is comfortable for pedestrians to be outside – specifically extending the winter and transitional seasons. A number of benefits would result:

- Additional short journeys on foot would reduce the number of cars used, reducing the heat generated on site and subsequently improving comfort further;

- Increased public transit ridership would result by improving the environment between public transit nodes and destinations;
- A competitive advantage for restaurants and cafes located near high traffic pedestrian paths, especially benefiting those venues with outdoor seating;
- Appropriate use of materials and shade will reduce heat absorption on site and reduce energy consumption for cooling.

The aim should be to achieve a 'cool island effect', which might well be a world first.

Future development should be required to appropriately respond to the climate of Abu Dhabi. Site layout and building orientation should maximize shade and channel sea breezes using continuous north/south orientated streets and air movement where possible. Additionally, connectivity with the sea will provide localized cooling effects. Shade can be provided through:

- extensive planting;
- colonnades and building overhangs;
- passageways through buildings; and,
- shade structures and screens.

Air movements can be further encouraged on site by varying building heights and incorporating localized devices such as wind towers. Enclosed areas can be improved by creating 'pools' of cooled air from internal spaces and water features. The best microclimates will be in narrow pedestrianized shady streets or enclosed courtyards where heat generation is low. The use of water sprays and/or misting is not generally favored. It is suggested that a series of new building regulations and statutory design codes need to be prepared to guide developers to adopt these sustainable design measures.

Utility Easements

The ability to create pleasant microclimates relies in part on the ability of the designer/developer to bring buildings closer together. This is not currently common in Abu Dhabi due to the following reasons:

- A focus on motorized transport has resulted in a large proportion of the ground area given over to roadways and parking.
- Road and street corridors are extremely wide due to utility easements.

Further Commentary

Plan Abu Dhabi 2030
Urban Structure Framework Plan

Usually, the utility companies will not permit any utility services beneath the street carriageway, preferring them to be located in utility easements located on one or both sides of the street. This creates utilities easements between 8m and 13 m wide on either side of all streets.

Currently, trees cannot be planted within the utilities corridor since tree roots can damage the services. As a result, trees are planted in a separate easement allowance and are installed with root barriers.

The obvious alternative location for utilities, other than in the current separate utilities corridors on either side of highways, would be to locate them beneath the highway carriageway. This is currently not permitted nor favored in the UAE. A study is recommended to identify new standards for infrastructure placement in streets to balance infrastructure service provider costs with potential wider urban benefits.

The Masdar Initiative

The Emirate of Abu Dhabi has set up the Abu Dhabi Future Energy Company (ADFEC) and committed itself to the Masdar Initiative which, among other aims, seeks to identify alternative energy sources, promote sustainable development, and to develop an 'exemplar' project at a site to the southwest of the Abu Dhabi International Airport. The following is taken from the request for proposals (RFP) issued to consultants:

"The Masdar Development Project, tied to the concept of 'source', must be conceptualized as a new and vital component to the Abu Dhabi urban fabric that results in a reduced ecological footprint for the city as a whole. It must be a source; a net producer of carbon neutral energy and nutrients (both industrial and natural) in a development style characterized by its promotion of both human and non-human life-promoting interventions. At the same time, this development must not contribute to the addition of toxic materials, locally or otherwise, nor the accumulation of persistent synthetic compounds in the biosphere. It should strive towards a net sequestration of atmospheric carbon rather than a net release."

This initiative offers a great opportunity for Abu Dhabi to become a world leader in promoting sustainable, low-energy design.

9.2 PRACTICAL APPLICATION OF THE URBAN STRUCTURE FRAMEWORK PLAN

The “Plan Abu Dhabi 2030” Urban Structure Framework Plan is intended to provide a clear vision for the overall development of the city of Abu Dhabi. It takes the broad view and the long view and it is a conceptual plan. It includes few specifics and, as such, by itself, it does not provide a simple specification for the development of any individual site. Until a city-wide Comprehensive Plan and development regulations, as well as area guidelines, are in place, specific development review must combine a logical interpretation of the intentions of this Urban Structure Framework Plan with evaluation of specific site conditions and direction from best urban design and planning practices in other urbanistically progressive cities.

When considering proposals, three key questions should guide the evaluation process:

1. Standalone Analysis - Is the concept for development logical, livable and aesthetically appropriate in and of itself?
2. Impact on Setting - Is the development compatible with its setting and are the negative impacts on the setting minimal and positive impacts maximized?
3. Market Demand - Is the development in line with projected market demand?

Standalone Analysis

This involves judging the compatibility of mixed uses, the suitability of architecture and the humanistic relationship between the development and the public realm of streets and other open spaces around it.

Impact on Setting

The minimization of negative impacts, and maximization of positive impacts of a development on its setting, is an area of consideration requiring review of area patterns and their extension on a site; evaluation of sun, shade, reflected light, wind effects and views; suitability of form, especially coherence of heights and, suitability of materials, color and landscaping. This also involves confirmation that there is infrastructure in place to service the development. It involves questions of environmental fit and augmentation; as well as social fit, contribution to community social objectives, including reinforcement of the extended family orientation of Abu Dhabi, and the development’s ability to provide social functionality and harmony.

Further Commentary

Plan Abu Dhabi 2030
Urban Structure Framework Plan

Market Demand

This requires ensuring that proposed developments are in line with true retail (not wholesale) market demand. Moreover, once projected demand for a single type of development has been adequately met, additional developments that would create excessive capacity within the same category should be prevented. Ongoing calibration of supply and demand is essential for the successful evolution of Abu Dhabi as a livable city.

All submissions for development approval need to be detailed, containing enough relevant information so that judgments on all three aspects described above can be evaluated. This includes comprehensive development plans and models; commentary on infrastructure involving utility companies consultation and traffic studies, with the onus on the applicant to prove how infrastructure and traffic management are to be provided; surrounding development, environmental and community impact analyses; and end-user market assessment. Specific submission requirements will be issued.

Within government, interpretation of the intent of this Urban Structure Framework Plan and its principles, policies and geographic content, must be available as schemes for development are initially put together. Once submitted, peer review of proposals is vital because urban design is as much an art as it is a science. Real estate assessment is key and government will update its market targets and expectations on an ongoing basis to provide up-to-date responses to proposals. Review by all relevant government departments is important and must be coordinated. A two-stage approval process may be necessary: conceptual or preliminary approval, and final approval at a more detailed level.

Early interaction between development proponents and government is prudent so that schemes are conceived and designed from the outset with the Urban Structure Framework Plan as a primary guide to what government will entertain for a site.

Finally, for areas of key interest in realizing the vision for Abu Dhabi in the Urban Structure Framework Plan, but where there are multiple landowners and developers, a collective collaborative process must be facilitated to create a coherent outcome. This involves infrastructure and the transportation systems and it must also involve the sharing of use allocations and practical, attractive urban design patterns. Development proposals in these cases must be coordinated as far as is possible; and this responsibility rests foremost with the involved developers, with facilitation by government when necessary.

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ABU DHABI URBAN PLANNING COUNCIL



PLAN ABU DHABI 2030

Approved Institutional and
Regulatory Framework

APPROVED INSTITUTIONAL AND REGULATORY FRAMEWORK

The Abu Dhabi Urban Planning Council (UPC) is the agency responsible for the future of Abu Dhabi's urban environments, and the expert authority behind the visionary Plan Abu Dhabi 2030 Urban Structure Framework Plan published September 2007. Chaired by His Highness Sheikh Mohamed Bin Zayed Al Nahyan, Crown Prince of Abu Dhabi and Chairman of the Abu Dhabi Executive Council, the Abu Dhabi Urban Planning Council defines the shape of the Emirate, ensuring factors such as sustainability, infrastructure capacity, community planning and quality of life, by overseeing development across the city and the Emirate as a whole. The Abu Dhabi Urban Planning Council ensures best practice in planning for both new and existing urban areas.

The Abu Dhabi Urban Planning Council's primary purpose is to deliver upon the vision of His Highness Sheikh Khalifa bin Zayed Al Nahyan, President of the UAE, Ruler of Abu Dhabi for the continued fulfilment of the grand design envisaged by the late Sheikh Zayed bin Sultan Al Nahyan and the ongoing evolution of Abu Dhabi as a global capital city. By drawing on urban planning expertise locally, throughout the GCC and around the world, the UPC strives to be a global authority on the future of urban planning and design.

In more detail, the UPC holds the following responsibilities:

- **Urban planning**, using "Plan Abu Dhabi 2030", the Urban Structure Framework Plan, as a foundation from which will be completed for Abu Dhabi:
 - A city-wide Comprehensive Plan and Comprehensive Transportation Plan
 - Area Plans for revitalization or completion of existing areas
 - Comprehensive Development Plans for new areas
 - Guidelines for all areas or character precincts within areas, and
 - Pervasive development regulations.
- **Development review.** The UPC will manage development evaluation and framing of recommendations regarding development applications which are large, are contrary to prevailing allowances, involve multiple plots, are for new development areas or are controversial. Routine development approvals will continue to be handled by the Municipality. There will be close liaison and coordination between the UPC and Municipality, including joint publication of submission parameters to guide where applications go between the two agencies. Initially, "Plan Abu Dhabi 2030", the Urban Structure Framework Plan, will be the principal document for codified reference of government intentions for development but, ultimately, more detailed and complete plans and policies, as they are completed, will provide augmented guidance.

- **Facilitating government activities** in pursuance of implementation of the “Plan Abu Dhabi 2030” Urban Structure Framework Plan, reinforcing the private development efforts underway in Abu Dhabi. This will involve close liaison and collaboration with all departments, agencies and authorities of government as well as initiatives within the UPC. Of special note are the potential value of pilot projects to model new ways of developing in Abu Dhabi or providing models for revitalization and upgrading of public places. Also recommended, are joint ventures with a new Capital City Commission to realize the Urban Structure Framework Plan’s intentions for Abu Dhabi as a National capital and seat of government as well as the home of the late Sheikh Zayed, Father of the Nation.

That the urban planning Council will be the custodian of the “Plan Abu Dhabi 2030” Urban Structure Framework Plan and the source for all interpretations of its principles, policies and geographic plans. Pronouncements by the UPC regarding this Plan should prevail and be final.

