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TOWARDS JEDDAH SMART CITY:

ASSESSING PEOPLE PERCEPTION OF SPACIOUS QUALITY INDICATORS IN OPEN SPACES.

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SPATIAL CONSCIOUSNESS ASSESSMENT; CASE STUDY: A RESPONSIVE SENSE OF PLACE, JEDDAH CORNICE DEVELOPMENT

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OUTLINE

- ✘ Jeddah City Waterfront Developments
- ✘ Statement Of Research
- ✘ Spacial Data analysis from collected Responses
- ✘ Benchmarking against actual surveyed case
- ✘ Explicit listing for prospect solution

FACTS

- ✘ Cities constant **urban spaces** development in space and time, subjectively affects the **quality** of life that they offer.
- ✘ Therefore enhancing **awareness** and **functional** uses within open spaces in terms of **implicate** public responses.

JEDDAH,

A city with Waterfront communities that:

- ✘ attract people all year round,
- ✘ has a strong character and economic backgrounds.
- ✘ It includes dramatically improving access to the waterfront,
- ✘ that is subject to continuous renovations while maintaining attractive, environmentally sound parks, open spaces and recreational opportunities,
- ✘ stimulating mixed use development.

SMART DEVELOPMENTS _ CLEAR VISION

Strengthening sustainability within a smart community often begins with a clear vision but it is really a process of:

creative,

local,

balanced decision-making

that continues to adjust to changing realities of community and urban living

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AIM OF THE RESEARCH

is to investigate the quality of open spaces provided along the seafront. In addition to analysis of measured emotional stress along the site studied a methodology adopted to answer similar research potentials (Taha et al., 2012, 2013), which can define to what extent different cultural environments can influence the perception of the surrounding situations.

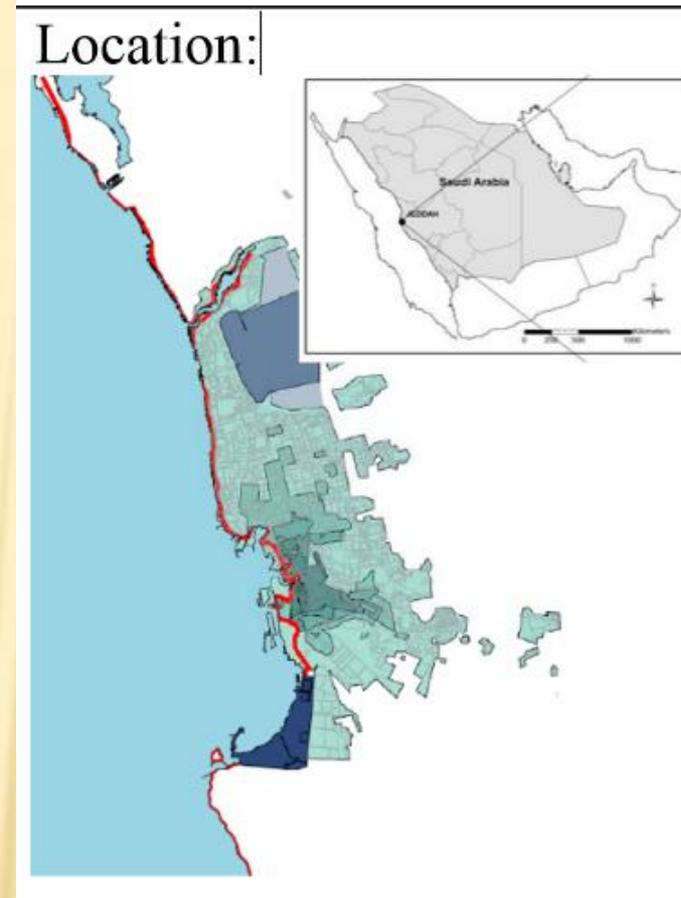
SAMPLE OF EXPECTATIONS

The fundamental principle is to elaborate and enhance the public realm, through transformation of the Gardiner corridor, the creation of networks of public space and parks, of developing park streets to the water that arrive at extraordinary waterfront plazas, of creating a public water edge, and enlivening the whole waterfront with new mixed-use residence and work environments (Nicholas, 2011).

Through Smart Growth, natural resources should be protected through open space design and conservation.

JEDDAH CITY IS THE MOST COSMOPOLITAN

- ✘ located on the seafront and the main gateway to the two holy cities.
- ✘ Its population is almost 3.2million but expects more than 15 million visitors yearly.
- ✘ Jeddah municipality strategic plan 2009, “what makes a city successful



JEDDAH MUNICIPALITY PLANNING 2014

The is proceeding and enhancing their strategic plan related to Jeddah waterfront since 2014 till now with upgrading the refurbishing. The main points of development are:

- Introduce integrated waterfront management
- Protect and enhance Jeddah's waterfront area
- Provide high quality facilities on the waterfront
- and Increase public accessibility

The waterfront Coastal Development extends on 12 km out of Jeddah Corniche is the 30 km coastal resort area

EXPERIENCE OF A RAPID URBAN GROWTH

Spatial expansion and transportation infrastructure expansion over the last 40 years with rates of change ranging from 0% to over 100 throughout the city indicating a wide variability across space and complex urban dynamics. Jeddah's population grew rapidly from 147,900 in 1964 to 3,247,134 in 2007 (Aljoufie et al., 2012).

Currently undergoing renovation, the Corniche will be renewed, expanded, and upgraded with restaurants, play areas, and entertainment (A.Nayer, 2015). The entire renovation phase should be completed around early 2014.

WHAT ASPECTS ARE CONSIDERED?



STATEMENT OF RESEARCH

Results for investigation done with groups of participants along specified walkways along the most populated Research Case study suggested will investigate the degree of responsiveness of various features on Jeddah coastal road, recreation areas, pavilions and large-scale civic sculptures through various undertaken experimental effects during different daytimes.

Data Collected through wearable devices interfaces consider the development of these emerging technologies and their social implications and applications. Tools admitted for the study The Physiological Stress Reaction (Bergner et al. 2011).

SPATIAL INVESTIGATION PROCESSES

The main demonstrated responses against stress points indicate the change of normal responses, causes are documented via cam recording and tracking specific site location via GPS location. Main steps of the research includes:

- Data analysis from collected data
- Benchmarking against actual surveyed case
- Explicit listing for prospect solution

PARTICIPANTS

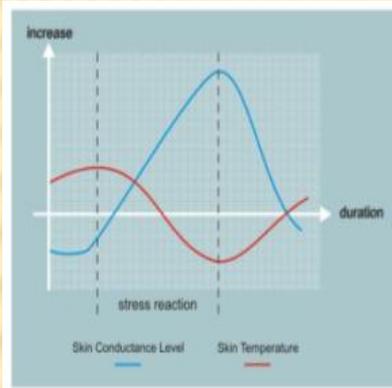
Project participants were selected based on average age of 30 to 40 years old.

Female majority contributed, since the approach is encouraging the families for outdoor activities in most comfortable way possible.

After observation the research team took decision to maximize the stress level by considering the trips on weekends (Friday evening, Saturday morning and evening).

The time selected for the trips was based on family gathering routines as well as peak hours for mostly populated part of the cornice as presented in figure 3, based on the methodological approach presented earlier in (A. Nayer, 2015).

WEARABLE DEVICES



SMART-Band;
The Physiological Stress
Reaction.

Catcam ,
continuous
recording device
for video to reflect
synchronized
reactions shown
on the interpreted
data

GPS Tracker,
(GTrekII) /GPS
Data Logger.
The ability to view
your journey on
Google Earth in a
virtual tour

TRIP DETAILS

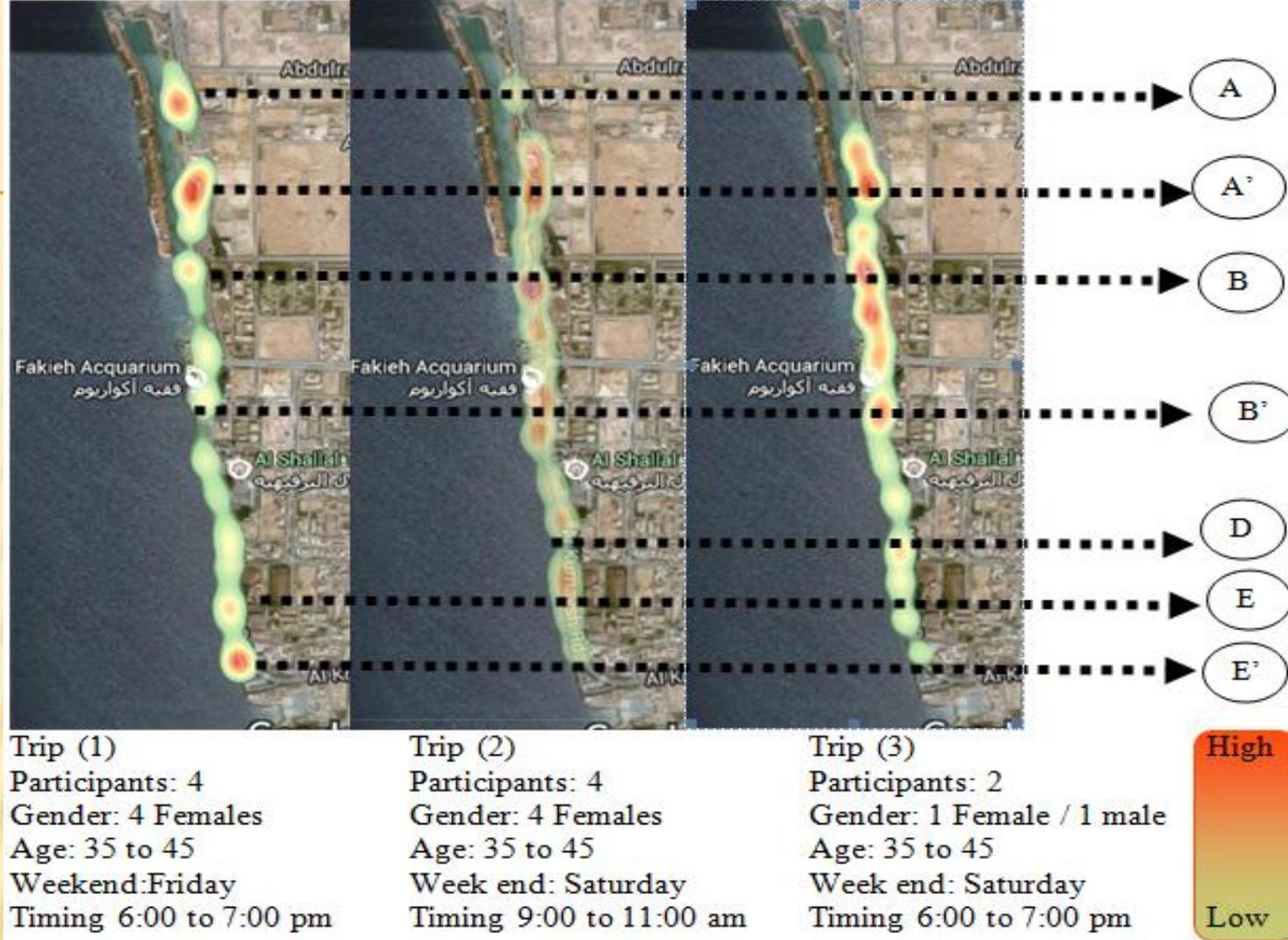


Fig. 3: Stress analysis on trips 1, 2 and 3 on weekend days.

ACTUAL INVESTIGATED SITE SPACIAL FEATURES

Waterfronts are dynamic places by nature. As an edge environment, the overlap of different communities of users and dramatically different conditions make for enormous amounts of complexity and energy as described in Jeddah experience

A. SPACIAL FEATURES



Entertainment facility at zone B crossing point, extended to a narrow walkway.



B. TYPICAL REFURBISHMENT:



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C DERIVED AREAS OF POTENTIAL DEVELOPMENTS



Point A_Mosque

Point B_Restaurants

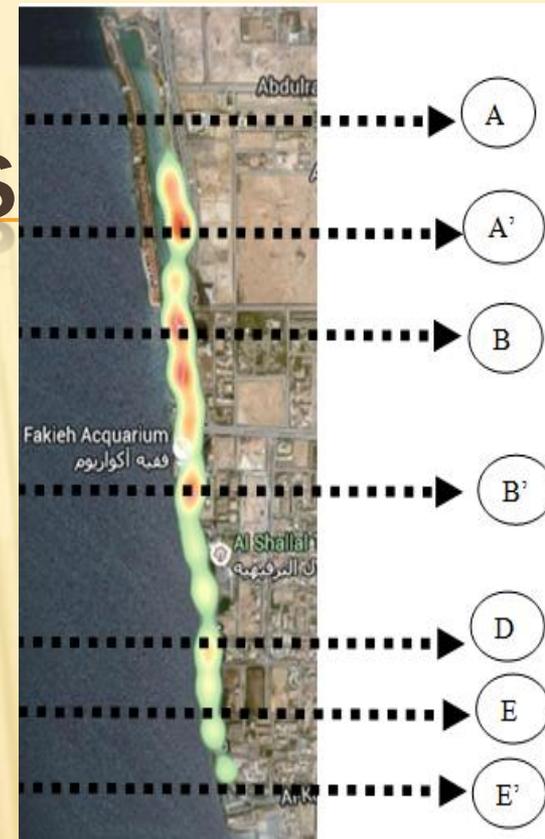
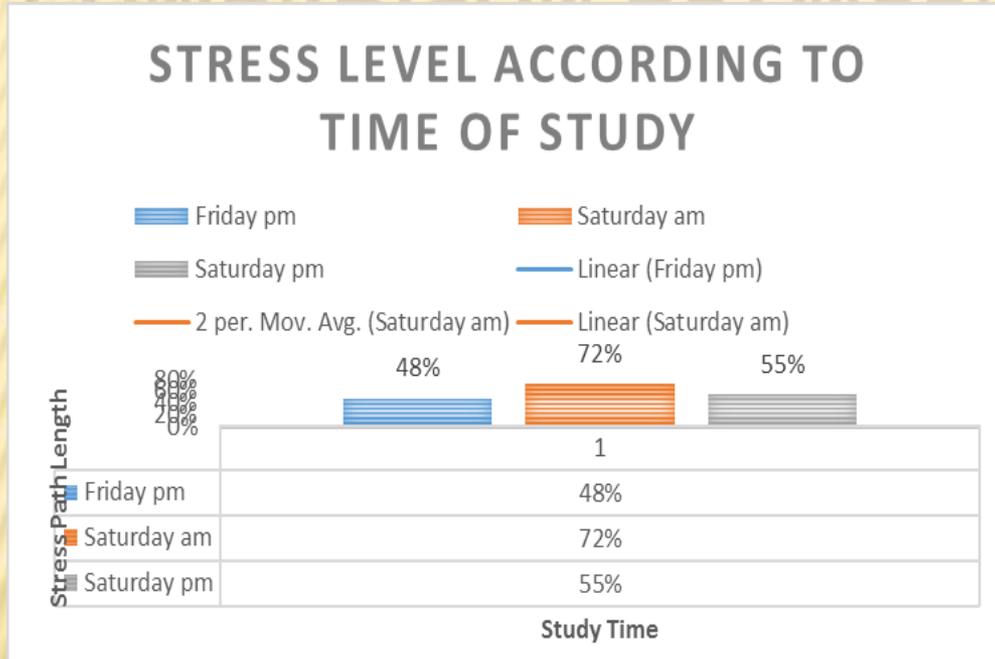
Point E' Parking, service road

ANALYSIS OF RESPONSIVE STRESS LEVEL PER PARTICIPANT ON EACH TRIP

Considering average path traveled under stress points (A to E) results varied according to complexity of the space configuration or crowded level due to time frames selected.

- ✘ the results shows that more than 50% of the extended walkway requires amendment to release the obstacles on the walkway, or provide for proper segregation from the amended facilities whether parking areas, service lots, food and beverage outlets or wc's and praying areas.

COMPARISON BETWEEN PATHS



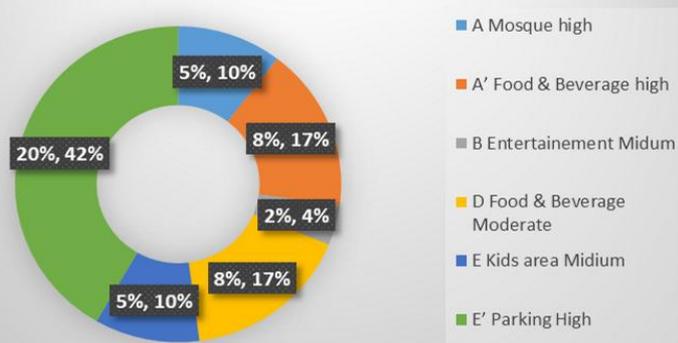
major service roads and parking area needs to be seen through for better solution. Segregation between large restaurants and families sitting areas overlapping the paved walkways.

TRIP 1 & 3, STRESS RELEVANT POINTS AGAINST FUNCTIONAL DIGESTIONS ON WEEKEND

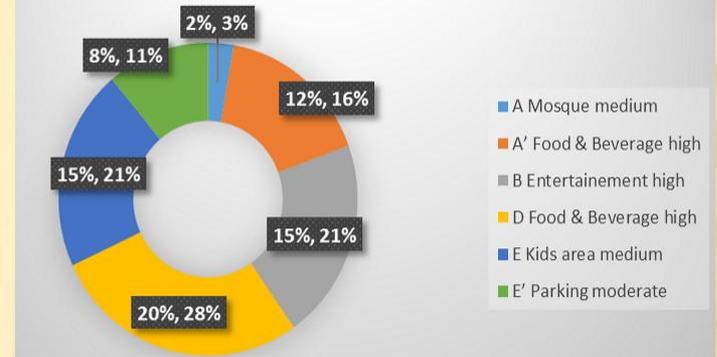
Major stress points	Functions and attractions	Friday pm Week end Total 3.5 KM		Saturday am Week end Total 3.5 km		Saturday pm Week end Total 3.5 KM	
		Density of pedestrians	Average Stressed	Density of pedestrians	Average Length	Density of pedestrians	Average Length
A	Mosque	high	5%	Medium	2%	none	0%
A'	Food & Beverage	high	8%	High	12%	high	15%
B	Entertainment	Medium	2%	High	15%	high	25%
D	Food & Beverage	Moderate	8%	High	20%	medium	10%
E	Kids area	Medium	5%	medium	15%	moderate	2%
E'	Parking	High	20%	moderate	8%	moderate	5%
Average		48%		72%		55%	

TRIP 1, 2 & 3, AVERAGE STRESS LEVELS IN TERMS OF PATH LENGTH

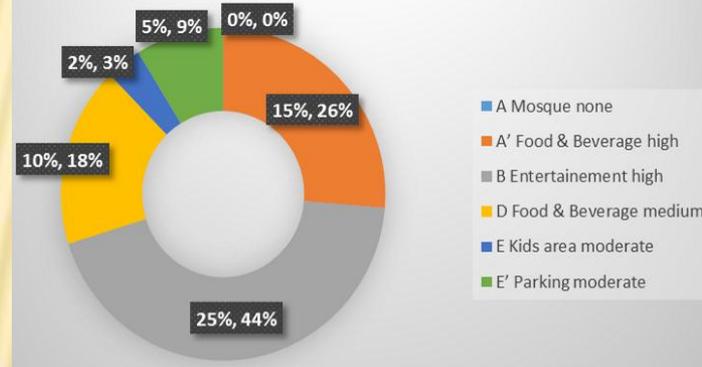
Friday *pm* average path Stress levels



Saturday *am* average path Stress levels



Saturday *pm* average path Stress levels



IMPLEMENTATION OF SMART CITY APPROACH

- × Take Advantage of Compact Design
- × Foster Distinct and Attractive Communities
- × Protect the Waterfront

CONCLUSION

Jeddah Smart Waterfront Potential developments

Under the theme of Smart Developments, Community interest in public open spaces becomes more challenging especially on waterfronts of cosmopolitan cities such as Jeddah. The results of data presented in the paper highlights potential of further design recommendations and future modifications in order to maintain sustainable entertainment areas as well as enhancing the quality of outdoor activities and sitting areas along the extended coastal development. Smart city approach suggested is implemented in order to explicitly generate solutions for further developments. Such Requirements provides implicit supports and encourages diversity taking in consideration long-term and external impacts into account during municipalities decision-making.

DISCUSSION & FINDINGS

- × Expected **High Stress** zone at the junction point of the connecting square; **NODE N** transferring from the inner promenade PPB to the cornice side , PPA, with minor contributions regarding everyday users safety and responsiveness while **crossing** main roads views, Flow of **Traffic** of connecting node

VIEWS OF CONNECTING NODE



Family Park placed in connecting square between *PPA* and *PPB*
Main Square at The start of the trip route is subject to an ongoing entertainment project as Jeddah Eye.

ADDITIONAL FEATURES

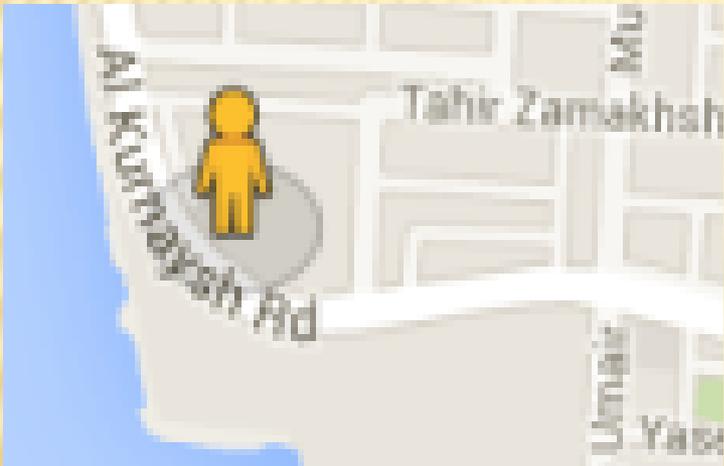
- ✘ **middle** temperamental **attributes** due to crowded picnickers on the cornice side. The pedestrian do experience a variety of existing **artifacts** along cornice Path PPA and entertainment activities.



- ✘ Municipalities Decision Making should be subject to public involvement regarding quality of services and activities provided by investigating current responsive reactions against added artifacts.

CHALLENGES

- ✘ Data gathered after **compilation** and **analysis** of corresponding location
- ✘ **Mapping** data represent stress levels deduced measurements,
- ✘ Further documentation of rapid changes should be updated.



THANK YOU

- ✘ Acknowledgment
- ✘ Questions and Discussion

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