Study on

Regulatory issues related to deployment of telecommunications networks in new property developments

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1 Base line

- Rationale and goal of the study
- State-of-the-art telecommunications networks/services
- Obstacles identified for deployment of state-of-the-art telecommunications networks/services

2 Assessment of operational models

- Integrated telco, Duct provision model, Dark open access, Lit open access, Developer telco

3 Options

A. General regulatory principles
B. Open Access policy
C. Market analysis and SMP for new developments
D. Accompanying policy proposals
E. Information and education of the market

About $20 billion worth of work is underway in the private sector on the Manama north shore

State-of-the-art telecommunications in N.D. are vital for

- attracting foreign investment
- establishing Bahrain as a preferred location for international high-tech businesses
- economic development, high standards of living and pace of innovation in Bahrain

SOM: Bahrain 2030 National Planning Development Strategies

Study commissioned by TRA in January 2008

Starting Point

- Kingdom of Bahrain facing rapid development in terms of new properties
- Large range of different new developments (individual houses, high-rise business towers,new islands, towns)

Goal of the study

Propose options for appropriate **regulatory approach** with regard to new property developments aiming to:

- provide adequate **incentives to invest** and to deliver **state-of-the-art telecommuni-cations networks and services** in new property developments; and
- ensure **consumer choice** and a **competitive telecommunications environment** in new property developments.

Definition of New Developments

For this study **we refer to New Developments as**

- an area, building or cluster of buildings,
- which is built for permanent use by its occupants,
- which was built after the enactment of the Telecommunications Law or will be built in the future,
- established on private ground (although framework in principle also applicable to new property developments on public ground) and
- for which telecommunications infrastructure and telecommunications services are being provided or shall be provided in the future.

- Short-term occupancy (hotels, lease offices) not covered
- Small, private residential buildings not subject to rules
- Covering all types of new developments from islands to industrial zones, high-rise buildings, new cities .....

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State-of-the-art telecommunications infrastructure

Mobile / Wireless networks

- The current range of wireless networks is not capable of offering high-bandwidth connectivity like that of fixed networks.
- The shared nature inherent to wireless networks places limitations on capacity availability.
- Wireless and mobile networks will be built on available fibre and hybrid networks and remain an integral part of state-of-the-art telecommunications infrastructure.

Fixed networks

- Considering
  - the importance for the economic development of the country and
  - the long-term vision envisaged in the national development plan 2030,

  fibre optics cable-based access networks are the only viable alternative
- Fibre is a critical pre-requisite for the viability of New Developments.

Wireless/mobile networks are not sufficient as state-of-the-art telecom infrastructure

JUCONOMY believes that an environment should be created which ensures the deployment of fibre access infrastructure in New Developments.

See also OECD: “Developments in fibre technologies and investment”, 3 April 2008

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Obstacles to deployment of state-of-the-art telecoms in N.D.

Market uncertainty
(investment (=supply) and demand)

- Demand side uncertainty (uncertain occupancy, long development time, ARPU, ...) impacts business case
- Investment risk for long-lived assets (supply side)
  - Civil engineering
  - Passive components
  - } 60 - 80%
  - Active components
  - Administration and maintenance

Regulatory uncertainty

- Which obligations, if any, may be introduced later on?
- Symmetric vs. asymmetric approach in New Developments
- Focus on infrastructure- or service-based competition?
  - Infrastructure-based competition is preferred
  - Multiple infrastructures may not be economically feasible

Connections to new developments

- Connection to the N.D. represents significant part of investment and influences the business case. Options:
  - Wholesale rental from Batelco
  - Establish own backbone networks ➔ requires access to public ground

Management of expectations

- Motives and capabilities of developers and telecom providers could be improved regarding
  - Information exchange between developers and carriers
  - Transparent and coherent selection mechanism
  - Knowledge of developers about competitive offers / assumption of Batelco as safe harbour

Conclusions from base line

Obstacles	Strategies	Conclusion
Market uncertainty (investment (=supply) and demand) Regulatory uncertainty	**The private sector** (developers and operators) **is developing models** which include **some kind of exclusivity** of the chosen operator and accompanying safeguard measures.	Harmonise the developer strategies to safeguard investment, by e.g. ▪ ownership of operator ▪ subcontracting or designing infrastructure ▪ obligation to provide wholesale or to bench-mark best market offer ▪ participating in decisions via e.g. board seat and bring these in line with the goals of TRA.
Connections to new developments Management of expectations	**Wait-and-see approach** by developers **might lead to inadequate telecommunications infrastructure**.	

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- Benchmark and conclusions

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Classification of New Developments

Technical classification

- In-house cabling solution for **fixed networks**
- Special requirements for **wireless solutions** (antennae space, mast and antennae sharing, sharing of in-house repeaters, line-of-sight for fixed wireless, environmental protection, e.g. signal propagation, etc.)
- **Joint usage** of network facilities (ducts, telecom rooms, risers)
- **Interworking** of several operators and / or networks
- **Requirements for construction of access of a building** to the public network (size of ducts, use of cables, physical access point, etc.)

Economic classification

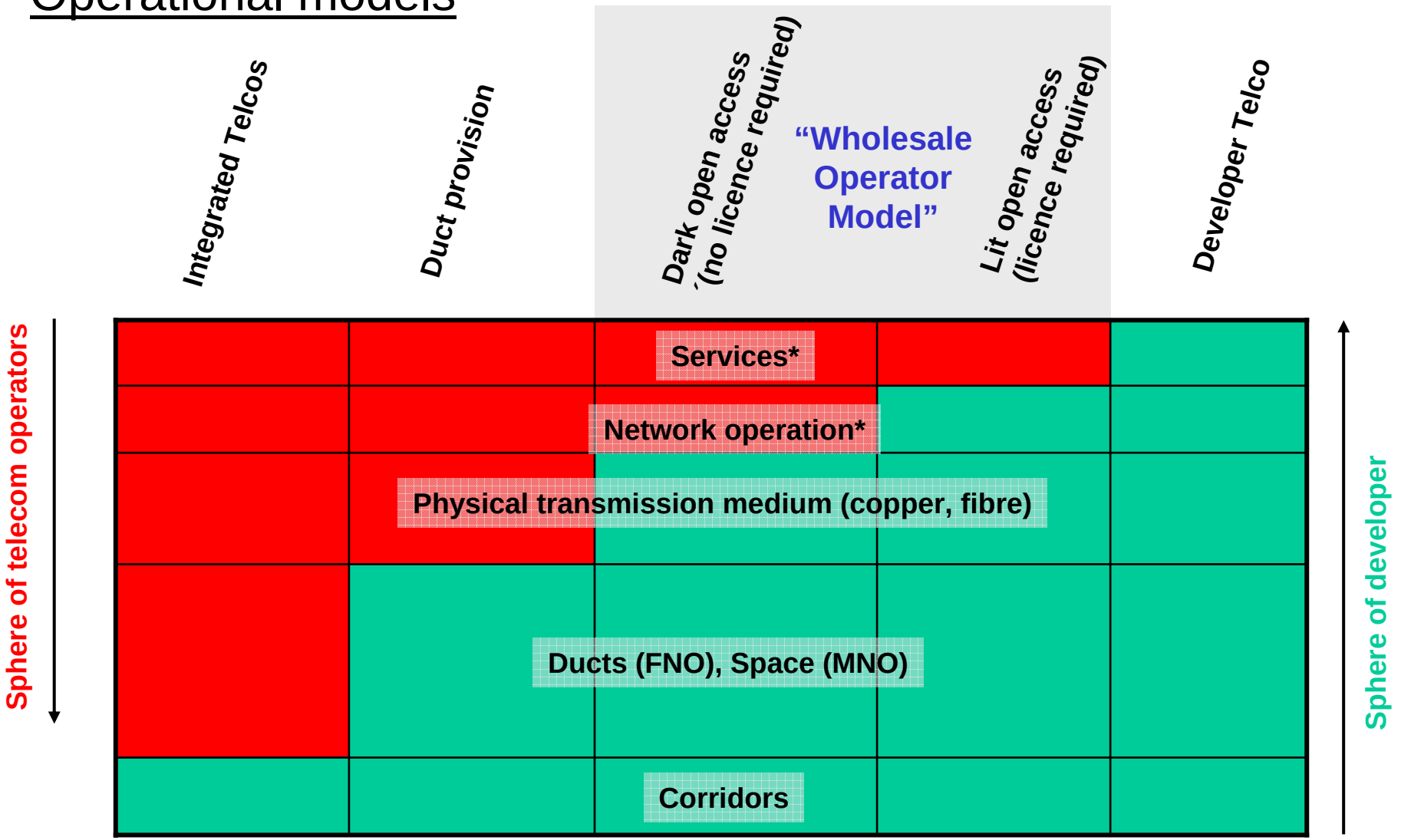
Two main classification criteria with impact on the regulatory approach:

- **The status of the project** (planned, under construction, completed).
- **The operational model**
  - depth of activities of developers / constructors / telecom operators in the value chain
  - areas with monopoly-like outcome vs. areas where competition is expected.
  - monopoly-like part of value chain needs to be provided to competitors on an equal, fair and non-discriminatory basis.

Technical classification important for generally applicable construction guidelines.

We will focus on operational models, which form the basis for regulatory treatment.

Operational models



*) For services and network operation a license is required

The height of the rows depicts the approximate relative amount of investment required

Integrated Telco

- Developer provides corridors (rights of way) on an equal basis and relies on market forces for investment in multiple state-of-the-art telecommunications networks and services
- This assumes the economic replicability of infrastructure

Strengths	Weaknesses
▪ Good environment for infrastructure-based competition provided that multiple infrastructure is economically feasible	▪ Potential lack of investment incentives even for one operator ▪ Telcos have to recoup investment from sales under a competitive environment ➔ Positive business case questionable
Opportunities	**Threats**
▪ Mobile operators will have advantages in rolling out their networks, because less investment is needed. ▪ First-mover advantage possible (starting and growing business as “one and only”)	▪ No telecommunications infrastructure until demand emerges. ▪ The value of the property decreases accordingly. ▪ Recoupment of investments highly uncertain ▪ Possible first-mover disadvantage due to regulatory risks (e.g. wrong regulatory assessment)

Duct provision model

- Developer provides ducts on an equal basis and relies on market forces for necessary investment in state-of-the-art telecommunications infrastructure and services

Strengths

- Good environment for infrastructure-based competition provided contestability of investment at the point of deployment
- Investment can be shared between various utilities.
- Upfront investment of telecom operator lower than in „integrated telco“ model

Weaknesses

- Demand uncertainty may make recoupment of investment difficult

  ➔ Positive business case questionable (but still better than in integrated telco model).
- Regulation regarding access and price may become necessary

Opportunities

- Mobile operators will have advantages to rolling out their networks, because less investment is needed.
- Regulation regarding access and price may be easier than in other models as reference would be rather to technical access and not commercial products

Threats

- Investment needed may not justify business case ➔ Choice of technology will therefore be constrained by economic considerations (but threat is less relevant than in integrated telco model)
- State-of-the-art infrastructure based on optical fibre may not be achieved
- Pace of roll-out potentially constrained by economic considerations

Wholesale model based on dark open access (home run fibre)

- Developer takes responsibility for passive infrastructure and provides fibre optic cables without active components as well

Strengths

- High bandwidth available
- Increased value of properties
- Business case for developer positive (if value increases higher than cost of home run fibre)
- Strengthening of Bahrain as location for international business
- Contribution to economic growth

Weaknesses

- Real infrastructure competition unlikely if not supported by duct access as additional tool for later entry
- Need to develop wholesale products

Opportunities

- Environment is conducive for development of innovative services
- Future-proof
- If duct access included (as an option for other telcos also to deploy their cables in ducts in parallel or later on), possibility of real infrastructure competition exists
- Potential new business from wholesale

Threats

- Telecommunications operators may be drawn towards service competition
- Wholesale only versus integrated wholesale and retail service provision to be sorted out (potential competitive problems e.g. margin squeeze)

Wholesale model based on lit open access

- Developer takes responsibility for active components and offers layer 2 or layer 3 wholesale products (non-discriminatory)
- Developer moves up one step in the value chain compared to the home run (dark) fibre model

Strengths

- High bandwidth available
- The price for the active components for GPON considered lower than for home run fibre but home-run fibre is future proof and allows for higher bandwidths and more innovation.

Weaknesses

- Continuous update of equipment and higher maintenance cost than in the dark fibre model ➔ risk of stranded investment
- Developer becomes subject to telecom regulation since a license is required
- Degree of service-based competition lower than in the dark fibre model.
- Real infrastructure competition unlikely to develop (if not supported by duct access)

Opportunities

- Good, though not perfect, environment for innovative services
- If duct access included (as an option for other telcos also to deploy their cables in ducts in parallel or later on), possibility of real infrastructure competition exists

Threats

- Wholesale only versus integrated wholesale and retail service provision to be sorted out (potential competitive problems e.g. margin squeeze)

Developer Telco

- Developer takes charge of the telecommunications infrastructure by ownership of the operator
- Identical to “Nuetel” solution

Strengths	Weaknesses
▪ Investment incentives for one telco	▪ Customers do not have choice between telecommunications operators
Opportunities	**Threats**
▪ Integrated utilities service provision and one face to the customer from developer’s side.	▪ No flexibility for changing environment in the future. ▪ No competition

Assessment of operational models with regard to the goals of investment incentives and customer choice

Integrated Telco	▪ Model assumes economic replicability of state-of-the-art telecommunications infrastructure including ducts. ▪ Since civil engineering and passive infrastructure represent major share of investment ➔ considerable risk that multiple infrastructures will not be built.	-
Duct provision	▪ Sharing of ducts between operators is a straightforward option. ▪ Risk that obstacles remain for deployment of multiple state-of-the-art telecommunications infrastructures. ▪ In JUCONOMY's view, risk of limited investment attracted and impaired economic development of the Kingdom	+
Wholesale based on dark open access	▪ Home run fibre ▪ Good solution in order to achieve state-of-the-art telecom infrastructure and services.	+
Wholesale based on lit open access	▪ Less potential for service development compared to home run fibre ▪ PON has the advantage of lower price, high degree of sharing and more scalable wholesale products.	+
Developer Telco	▪ Model deprives users of choice ▪ Investment incentives only for one operator	-

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The basis for regulatory policy

- **Application of existing telecom law**
  Telecommunications Law is applicable to private developments (e.g. rights of way) as well as to public ground to which most of the principles may also be applied
- **Involvement of developer to mitigate investment risk**
  The role of the developers is crucial and depends on the extent of elements of the value chain which they cover.
- **Open Access policy**

A - General regulatory principles

TRA intervenes only in case of market failure

- Intervention only
  - when a developer chooses a model where no operator is willing to invest or where negotiations regarding access fail
  - or possibly in situations where the operational model does not allow for competition but has been established before the definition of a regulatory policy

Ensure wireless / mobile access

- Enforcement of the corresponding use of private property for mobile facilities pursuant to section 61 of the Telecommunications Law

Application of Sect 65 of Telecom Law

- The provisions of section 65 may be especially applicable in case a developer/owner closes a contract with one operator granting exclusivity

USO is not the appropriate tool

- The application of USO (section 64) with regard to the provision of telecommunication services in new developments does not appear to be the appropriate tool, i.e. it does not fit due to the limited scope

B - Open Access policy

Open access policy

- Open access can mitigate significant share of deployment cost
- Possibilities for competition between several providers using the same infrastructure increase
- Provisions concerning rights of way and access rules would be instruments to ensure open access based on tariff controls
- Implementation recommended at the layer where monopoly-like behaviour is observed. The level addressed depends on the operational model
- If no operator invests, TRA should encourage the developers/owners to deploy the telecommunication infrastructure at their own expense and to have it operated by a third party providing open access to all interested parties.
- This should be supported by duct access in order to allow later infrastructure-based competition on a separate physical transmission medium in the same duct

C - Market analysis and SMP for new developments

N.D. as part of national market

- Bahrain market too small to move to sub-national market definitions without evidence that this is necessary
- Dominance / SMP should therefore in principle apply as currently determined also in N.D.

Symmetrical regulation

- Symmetrical regulation for operators in new developments (mutual access obligations without Dominance / SMP regulation)
- This option ensures that later entrants do not meet barriers to entry and that competition is ensured
- Still, investments of first movers are incentivized

Remedies on a case-by-case basis

- In case of market failure, TRA should have the option to define the N.D. as single markets and, consequently, evaluate whether a dominant position exists

Safeguards against price-cost squeeze

- Tariff regulation needs to take into account whether the enterprise which invests in infrastructure in N.D. also chooses to offer retail services
- In such a case, regulatory safeguards to avoid price-cost squeezes may become necessary

D - Accompanying policy proposals:

Technical regulation

- Policies A-C may be accompanied by e.g. obligations to publish a reference offer, technical rules, etc.

Open Access in the law

- Adaptation of sect 57 (e) to allow open Access obligation for all operators

Open Access in License

- Obligation for all network infrastructure providers which have established a network on a N.D. to offer wholesale services and to allow for service competition
- This may require license amendments

Construction law

- Change in construction law
- As developers/owners are paying for roads, water and power supply infrastructure, construction law could be amended for telecommunications infrastructure
- This could also be a requirement for the award of a building permit

E - Information and education of the market

Information by TRA to market

JUCONOMY proposes that TRA informs the market participants

- about the position of TRA concerning regulation of new developments
- as well as possible measures to ensure customer choice and sustainable competition.
- about the best practices for telecommunications network deployments in new developments

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Backup slides

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Benchmark

United Arab Emirates

- Experiences similar growth of new property developments.
- Regulatory situation is not comparable due to
  - lack of detailed provisions for USO and SMP regulation
  - "infrastructure duopoly approach"
  - lack of rules for right of way in private properties

France

- Main issue is FttH rollout. ARCEP favours
  - Duct access obligation for France Télécom
  - Symmetrical obligation for sharing of in-house cabling
  - Amendment of construction law regarding obligatory fibre rollout to newly-built premises (for apartments > 25 units)

Hong Kong

- Main features of the access regime are
  - Independence of SMP position / status
  - Existing access competition and rules for mutual access
  - Cooperation obligations
  - Applicability of telecom regulator's rules to owners and landlords also
  - Detailed technical rules are in place

Summary: there is no regulation of new property developments which is fully developed and could easily be adapted to Bahrain.

Open access policy

Duct sharing

Sharing of layers

- Best solution for all parties achieving cost savings by a reduction of the number of excavations in the same place and by limiting the negative impact on inhabitants
- In some cases, a neutral party has laid out a sufficient quantity of fibre so that several different players who lease fibre can share the same cabling.
- Discussion can continue layer by layer as to where in the infrastructure model it is more acceptable to have monopoly-like situations, and where there is a requirement for competition.
- The higher in the structure model we get, the greater the prerequisites for competition.

Irrespective of where the line is drawn, it is desirable that the players who operate on one level in the value chain, where they have a monopoly, should maintain neutrality ➔ open access policy

Investment risks - Involvement of developer

Investment incentives

Competition

High-speed broadband, achievable with fibre-optic access networks will be crucial for economic development.

A possible solution could be public sector involvement and implementing open access policy.

Applied to Bahrain, this means that developers should be more involved in ensuring the availability of telecommunications infrastructure in N.D.

Advantages of suggested approach:

Soft approach:

- Regulatory certainty is provided
- In theory no involvement by TRA
- Market analysis and potential SMP regulation of N.D. proceed only in case of market failure

Step-wise regulatory approach:

- The first step is application of existing Telecommunications Law
- In parallel, change to law should be considered to establish prerequi-sites for open access and possibly obligations in construction law

Approach gives leeway to TRA:

- TRA is open to decide when and where to intervene.

Approach is based on encourage-ment and incentives instead of obligations

No specific model is prescribed:

- Developers are free to choose the operational model.
- In case monopoly-like behaviour is detected in a specific layer, open access policy shall be applied by TRA.

The approach is based on a shared responsibility between developers and operators according to benefits achieved from providing networks and services