

# The Security Impact: Conceptual Assessment of the PNG Air Transport Industry

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## Summary

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This paper was developed in response to ICCC's document titled: ***"Issues Paper: PNG Air Transport Industry (20<sup>th</sup> March 2006)."*** The aim of this paper is to postulate views and comments related to the **security issue** within the PNG Air Transport industry and particularly on how it affects the overall economic efficiency of the PNG Air Transport industry.

The paper attempts to conceptualise the PNG Air Transport industry from the PNG Government perspective focusing on the issue of security and economic efficiency. It then tries to formulate scenarios of which will affect the security issues within the next decade and examine their impacts. From these analyses, it was concluded that security issue in the PNG Air Transport industry was a complex issue that will continue to impair the overall economic efficiency of the PNG Air Transport industry. Finally, it was proposed that an actor, network and system analyses be performed to explicitly investigate and aid ICCC to make profound recommendations to the PNG Government.

The basis of this paper was developed out of interest therefore the contents are a representative of an individual views and comments thus questions and remarks are welcome.

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## Relevance of Security Issue in PNG Air Transport Industry

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Security concerns in the Air Transport industries across the globe have been high on the agenda due to the ongoing threat of terrorism. This situation might not seem to have affected PNG directly but the external effects and pressure from the international Air Transport stakeholders have disseminated through and impacted national Air Transport operators in PNG who want to remain competitive. Intensification of security measures internationally surely comes at a price that is exceedingly overwhelming. In addition, domestic security measures have to be maintained regularly considering the social, political and economic conditions of PNG. This puts operators in the PNG Air Transport industry in a backbreaking and exorbitant situation.

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## Arrangement of Security Services Management

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Current arrangement of security services management in the Air Transport industry of PNG is also of critical concern. It can be concluded that CAA, Air Transport operators, and the Immigration or now Customers under IRC are providing these services. These security services are provided directly by these actors or through outsourcing under contractual agreements. However, who is responsible for what is really unclear at the operational level. Chances are high that these services are duplicated and as such are limiting factors for coordination and communication during normal and contingency operations. Moreover, it is highly plausible that logistical processes are inefficient, information management is inoperative and transaction costs are miscalculated as a result of such arrangement.

Accordingly, this will only accumulate uncertainties for Air Transport industry stakeholders who in response commit more funding to manage such risk thus raising their operational cost.

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## Casual Analysis of Security in PNG Air Transport Industry

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For the purpose of addressing complex public policy issues, a causal analysis needs to be performed to bring to light the factors that influence the criterion of economic efficiency, according to cause-and-effect reasoning. In this analysis security is referred to as measures taken to guard against and respond to danger from e.g.: terrorism, crime, sabotage, attack, or unethical behaviour from the lack of respect for life or property. As such, it is an important companion to Safety. However, for simplicity and comprehensibility in analyzing the impacts, Safety and Security issues in the Air Transport industry in PNG have been systematically isolated and only the Security issues have been delineated. The conceptualization will take the perception of the Government and focus on factors from policies and regulations, risk scenarios, security aspects in Air Transport industry, cost implications and its overall impact to the economic efficiency of the Air Transport industry in PNG.

During this casual analysis, distinction had been made on certain factors and propositions. First, certain factors mentioned in the analysis are external factors; meaning that these factors are not within the control of either CAA or the Ministry of Transport but are under the governance blanket of the PNG Government. However, some are outside their scope of governance, which are from international organizations or from global pressure or trends such as international policies for regulations on aviations security. Informal organizations and technological advances can also be categorized under external factors outside the scope of the PNG Government control unless specifically indicated. Second, the direction of impact or influence can either be positive or negative depending on the correlation between each factor. For instance, price of services and products have a positive effect on revenue. If prices increase the revenue will increase and if price decrease the revenue will decrease. That is represented with a '+' symbol. A negative correlation is represented with a '-' symbol. For instance, if security concern increases, it reduces the service adequacy and if security concern decreases, it increases the service adequacy. The symbol '?' signifies that the correlation is implicit and that the impact can either be positive or negative depending on the certain situations that needs further enquiry. Third, not all factors are necessarily consider to be variables of which will increase and decrease. Example for a variable factor is end user demand. A non-variable factor is local regulations and policies. Lastly, PNG Air Transport industry operators are considered here to be both those operating in the market for passengers and freights. Below is a brief explanation of the casual analysis in Figure 1.



Finally, the accumulation of “security concern” affects the PNG Air Transport industry operators’ operational and maintenance cost; service quality, adequacy, scope, and density; investment options for expansions on infrastructures and facilities; and marketing strategies. Service quality and adequacy influence end user satisfaction which more or less determines the end user demand. With limited end user demand, revenue for the Air Transport operators will be limited as well thus affecting their profit margins. With higher operation and maintenance cost, technical efficiency (the provision of a product or service at the minimum cost) will be arduous to minimize thereby elevating the cost of the services offered by Air Transport industry operators. Furthermore, lack of profit by the operators in PNG Air Transport industry means that less investment on expansion options in infrastructures and facilities. This then affects the quality, scope, density and adequacy of services being provided that eventually affects the overall economic efficiency of the PNG Air Transport industry. This economical inefficiency is reflected by its input towards the country’s GDP.

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## Scenario Analysis

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Scenario analysis, which is primarily to address uncertainty, can provide new insights and improve the decision and policy making processes. Uncertainty has already been under discussion under casual analysis but then the focus was on how it influences the security concern. On the contrary, in scenario analysis, the focus will be on external and uncontrollable factors as perceived by the PNG Government on the causal mechanism of the system or on specific internal factors. Furthermore, scenario analysis will try to identify plausible events that are highly uncertain of which will have a great impact on the issue of security thus affecting the economic efficiency of the PNG Air Transport industry within the near future. In this context, it is essential that a key question relevant to a very important internal factor be posed and evaluated under several environmental scenarios or scenarios that depict how the environment of the policy area or system for which the forecast is being made could develop.

### Key question

In the ICCC Issues Paper, “PNG Air Transport Industry”, the commission also seek views on the likely developments or changes in the existing structure of the air transport industry including entry of new service providers, over the next decade. Given that Security is the key factor in this analysis, the basis of the scenario analysis will focus on this factor with the following key question:

***“How security concern in the PNG Air Transport Industry will develop in the future and particularly in a time frame of 10 years?”***

### External Factors and Mega-trends

In designing the system diagram, several significant factors in the environment of the system that cannot directly be influenced by the PNG Government in this situation have been delineated. Some of them and particularly the most abstract ones are in fact mega-trends that drive changes in the environment of the Air Transport industry in PNG, and in so doing influencing security aspects within the Air Transport industry consequently setting off changes in economic efficiency as illustrated in the casual analysis. A list of these mega-trends provided below was formulated using the PEST analysis:

- *Politics*
  - a) Changes in international regulations.
  - b) Changes in Political stability within the PNG Government.
  - c) Changes in international Trade Policies.
  - d) Changes in Terrorism or War Trends.

- *Economical*
  - e) Changes in Economic conditions of the country.
  - f) Regional and Global Economical Trends.
  - g) Major change in interest rates and Kina Currency rates.
  - h) Major market transitions – market failure, market demand and competition magnitude in transport markets (road, air, sea).
  - i) Major business transitions – mergers, cross-boundary alliances, PPPs, acquisition, bankruptcy.
  - j) New entrepreneurships of Air Transport services and products.
  - k) Changes of ownership or Shareholders change of interest in major Air Transport operators and airport facilities.
  - l) Change in business incentives from governments or regional bodies.
  - m) New network externalities associated with new air transport services and products.
  
- *Social*
  - n) Changes in lifestyle and access to new ideas or beliefs.
  - o) Shift in citizens’ (community) initiatives towards air transport services and products.
  - p) Law and Order Problems.
  - q) Public Trust in Cooperations.
  - r) Respect for Government.
  - s) Changes in Tourism Growth
  - t) Changes in Media Views
  - u) Ethnical and Religious changes
  
- *Technological*
  - v) Speed of Research and Development of air transport security services and management.
  - w) Development of new ITC services and products applications for coordination and communication.
  - x) Shift in the technological industrial capabilities of air transport services and products.
  - y) Development in competing technological solutions for transport.

These factors are plausible events that will influence security aspects within the PNG Air Transport industry within a time frame of 10 years so how these changes are thought to come about will be elaborated briefly in the next section.

*Table 1: Classification of external factors/mega-trends.*

	<b>Low Uncertainty</b>	<b>High Uncertainty</b>
<b>Low impact</b>	(c), (i), (j), (l), (n), (o), (q), (r)	(b), (m)
<b>High impact</b>	(a), (e), (f), (g), (h), (k), (t), (u), (v), (w), (x), (y)	(d), (p), (s)

Eight of the above mega trends, namely (c), (i), (j), (l), (n), (o), (q) and (r) are considered to be of low uncertainty and impact towards security aspects within the PNG Air Transport industry in the next 10 years. The occurrence of these events can be predictable to a certain degree and their relative importance to the key question is insignificant. The mega trends (a), (e), (f), (g), (h), (k), (t), (u), (v), (w), (x) and (y) are of significance relevancy to the security issue however, their probability of occurrence can be easily anticipated by vigilance observation. Furthermore, mega trends (b) and (m) is of little relevance to the key question as well but are highly unpredictable thus only mega trends (d), (p) and (s) qualified for scenario design since they are regarded as highly uncertain and having high impact at the same time on the security issue. Below, it is essential that these three critical mega-trends be elaborated further.

**(d) – Changes in Terrorism or War Trends.**

This event can greatly affect the security aspects of the PNG Air Transport industry in particular the facilities and end users. That will mean drastic changes are required to step up security measures to ensure that any such dangerous acts from such circumstances is avoided. All this will come at a cost to the industry and the end users especially. Only one event of such within the PNG Air Transport industry is enough to cripple the entire tourism industry and its impacts are vastly distributed across other industry sectors as already experienced in Bali, Indonesia. It is how security issues are managed and coordinated by the stakeholders in the PNG Air Transport industry that will greatly come under attention if such circumstance transpires. This will in turn determine whether investment or expansion of services in the PNG Air Transport industry is rationally viable.

**(p) – Law and Order Problems.**

Trends in law and order problems can be generally forecasted however, the sources and dynamics of such problems are very difficult to isolate and tackle. Any unjustified and unethical conditions can bring about a sudden security concern towards the PNG Air Transport industry if opportunists have it their way because of situations triggered by other unexpected events. Law and order problems are the biggest impediment towards the socio-economical development of PNG. It has kept both the public and the private sector industries at ransom from functioning effectively and efficiently. It is beyond reasonable doubt that PNG Air Transport industry is also a victim of this persist predicament.

**(s) – Changes in Tourism Growth.**

Major changes in tourism development are bound to have very tremendous effects on the overall PNG Air Transport industry. This will mean either an increase or decrease in demand for end user services but certainly that will come at a cost if competitors within the industry want to retain their market share. Security is obviously integrated with tourism boom. Ineffective and inefficient security measures will be seen as an obstacle that will have negative implications to the economic efficiency of the PNG Air Transport industry even if it means growth of end user demand.

**Scenario Design**

After a thorough consideration of all the six possible scenarios that can be concocted, four of them have emerged as most consistent and plausible, and are elaborated below in detail.

*Table 2: Plausible Scenarios.*

	<b>Scenarios</b>			
<b>Mega-trends</b>	<b>S1</b>	<b>S2</b>	<b>S3</b>	<b>S4</b>
<b>Changes in Terrorism or War Trends</b>	High	Low	High	Low
<b>Law and Order Problems</b>	High	High	High	High
<b>Changes in Tourism Growth</b>	High	Low	Low	High

- a. **Scenario 1 (S1)-- "New World Order"**: Tremendous escalation of terrorism within the Asia Pacific Region will cause high security concerns across the region as a result heightening trade and immigration policies. Couple with the increase in law and order problems domestically will give raise to pressure from international organisation, governments and relevant authorities to demand that security measures are advance so that end user security is assured. Continuation of increase tourism activities will create further security concern in the PNG Air Transport industry. All these will negatively affect the cost of the Air Transport operators. Moreover, since growth of other sectors, which are highly dependent on the PNG Air Transport industry will also be affected, it is likely that in this scenario security will be the biggest determinant factor which trade offs are based on. From a different perspective, another scenario that will bring about similar repercussions is if war or civil unrest was to escalate within any of the provinces in the country will at the same time having high rates of terrorism and tourism. That will certainly be an issue of which will not bring any positives to the PNG Air Transport industry. Looking at it, this will only result in the need for high security measures coming at a substantially high price.
- b. **Scenario 2 (S2)-- "Scrambling Through"**: With the economy still dragging through into the next decade, social instability, unemployment, unequal distribution of wealth, soaring educational fees and poverty become abundance issues which give raise to relatively high law and order problems. Simultaneously, tourism plunge as a result of these dire situations. The accumulation of law and order problems will be very overwhelming that it will necessitate attention for security in the PNG Air Transport industry. In addition, it will create a negative impact on the growing tourism industry, mobile business travellers and transportation of freights to and from economic regions within the country. Although terrorism being registered at the low mark will not have any bearing in compromising this security concern as the threat will now be prevailing domestically. Under this scenario also security level will increase as a consequence demanding stringent measures that will certainly be costly.
- c. **Scenario 3 (S3)-- "Tropical Wave"**: In the coming 10 years, a more global instability generates increasing concerns for terrorism. Simultaneous overwhelming domestic law and order problems bring no benefit to the PNG Air Transport industry as tourism level plummets. Low tourism growth greatly impacts on the revenue of the Air Transport industry operators. With very critical security issues also in the Air Transport industry soaring, Air Transport industry operators can only struggle to remain in business and maintain operation. Immediate short term strategies to tackle this scenario will be to face the challenge head on for which the end users will be held at ransom. Cost of airfares and freight services will increase as security intensifies. This is the most salient and worst case scenario that can significantly impact on security within the PNG Air Transport industry in the next 10 years as its impact will have large repercussions on the overall economic efficiency of the industry.
- d. **Scenario 4 (S4)-- "Backyard Connection"**: Consider a growth in tourism which subsequently increases end user demand. PNG Air Transport industry operators are propitious to rip the benefits. In addition, a decline in global terrorism and war activities was even more rewarding as this will only boost tourism activities. Such promising developments will certainly capture interest of potential investors. On the other hand, severe domestic law and order problems can only cause concern from PNG Air Transport industry operators and potential investors. Security issues will entail risks of which controlling measures for mitigation only defy the positive effects dispensed by tourism growth and decline in terrorism and war activities. With such contradicting effects in this scenario, it can be concluded that security concern will prevail thus adversely affecting economic efficiency of the PNG Air Transport industry.

#### **Conclusion from Scenario Analysis**

It can be concluded that the key question performed similarly in each scenario that is it tend to increase the security concern and hence will affect the cost of operation for the Air Transport operators thus raising the price of services which can be an impeding factor on the overall economic efficiency of the PNG Air Transport industry.

In a nutshell, even though it has not changed the essence of the existing problem on the security issue within the PNG Air Transport industry, the above scenario analysis has led to two very important insights. First, the trends in security aspects mainly reflects trends or changes in any significant component of it, and second, the problem of security can be seen not just as a problem arising from one external factor but also as one of uneven distribution of external factors over time. It is also essential to clarify that all of the above-described scenarios are long-term ones and may not be realised in the very short run. This is highly relevant when it comes to air transport industry related activities, which, in most of the times, have a lifetime of about 10-30 years. However, any developments concerning the mega-trends of these scenarios should be monitored so as to update the scenarios regularly. Monitoring developments and updating the scenarios can give dynamics in the evaluation of the security aspect, and where necessary continue to make adjustments to the problem formulation of inefficiency in the PNG Air Transport industry.

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## Conclusion

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At this stage, it can be said that entry and investment cost in the PNG Air Transport industry is noticeably high. Operators, Government and other stakeholders will want to see a substantial profit margin in the Air Transport market to have an optimistic sight on their return on investments. Currently, the stakes are high therefore risks have to be identified and sounding mechanisms have to be in place to mitigate and control these risks. Security is a very crucial risk factor for the PNG Air Transport industry stakeholders in particular, Air Transport operators who time and time again want to ensure that their customers, and facilities are not been victimise. Apparently, it is the end users who are made to account for such cost and so this dynamics continues anonymously hindering economic efficiency and segregating development in the PNG Air Transport industry.

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## Recommendations

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The general issue of security within the PNG Air Transport industry is a multi-disciplinary, multi-actor, multi-context and multi-level problem. Economic efficiency alone will not be achieved without the meaningful contribution from other interrelated knowledge disciplines such as information and communications technology, governance, physiologies, law, business and cooperate management, only to name a few. Actors of various levels within the formal and informal sectors will have their interest either realised or jeopardised because of the security issue. The importance of the security issue varies depending on the interests of the actors. Furthermore, the level of complexity also fluctuates depending on the context of the issue in which security is related. It is from this perspective that I recommend the following be conducted to further analysis and determine the bottleneck areas of the PNG Air Transport industry that are thwarted by the security aspect and thus contributing to economic inefficiency to the industry.

### Actor Analysis

The primary objective of this analysis will be to identify the most critical actors and the way they perceive the security issue within the PNG Air Transport industry. How they tend to act to influence the security issue in shaping it to serve their interest. In particular, identifying their specific criteria and means towards achieving fundamental interests. In this way, it can create a better insight into the security issue and form the basis for the next step, which is the network analysis. In this analysis the following questions can be investigated.

- 1) Who are the critical actors within the PNG Air Transport industry that have great interest in the security issue?
- 2) How do the critical actors within the PNG Air Transport industry perceive the issue of security?

- 3) What are the main differences and similarities of the interests and objectives of the critical actors within the PNG Air Transport industry with regards to the security issue?
- 4) What are the functions and responsibilities of the critical actors within the PNG Air Transport industry towards the issue of security?
- 5) Under what conditions and criteria are the critical actors within the PNG Air Transport industry dealing with the security issue?

### **Network Analysis**

After the actor analysis is performed, analysis into the dynamics in particular, the relationships and dependencies that exist between these actors in relation to the security issue. Actor analysis and network analysis are highly correlated to each other and will together help to enrich our insight towards the security issue and how economic efficiency can be achieved without harming the interest of the stakeholders.

Here the network dynamics will also be examined by understanding that unpredictable or predictable external factors can influence the interest of the actors and so their relationship adding a dynamic perspective. In many cases, this impact on the network dynamics can trigger a significant change in their perception of the security issue within the PNG Air Transport industry. The analysis can focus on answering questions such as:

- 1) What are the characteristics of the relationship between the critical actors within the PNG Air Transport industry in relation to the security issue?
- 2) What are the degrees of dependency between the critical actors within the PNG Air Transport industry in relation to the security issue?
- 3) To what extent are the replace-abilities between the critical actors feasible in relation to the security issue?
- 4) What distinguishable external factors can be identified that will influence the dynamic nature of the relationship between the critical actors within the PNG Air Transport industry?
- 5) To what extent do the current Government policies and regulations on security issue within the PNG Air Transport industry affecting the nature of the network relationships between the critical actors?
- 6) To what extent does the current PNG Air Transport industry structure have on the security issue within the PNG Air Transport industry and how does this affect the nature of the network relationships between the critical actors?

### **System Analysis**

In the system analysis, the interaction of the factors that influence the security aspect within a system's boundary can be evaluated against the objectives, constraints, and alternative courses of action (measures) from the PNG Government perspective. Examination of the probable consequences of the alternatives in terms of costs, benefits, and risks and the presentation of the results in a comparative framework so that the PNG Government can make an informed choice from among the alternatives on which measure can be taken to effectively and efficiently tackle the security issue thus accomplishing economic efficiency in the PNG Air Transport industry. An illustration of the system analysis diagram is presented in Figure 2 as an example. However, essential answers to questions of this nature posed below have to be answered.

- 1) What is the boundary of the system for which the PNG Government can be able to influence in relation to the security issue and in particular related to the overall economic efficiency of the PNG Air Transport industry?
- 2) How can the issue of security be influenced by the PNG Government thus causing a desirable change on the overall economic efficiency of PNG Air Transport industry?
- 3) What are the objectives of the PNG Government and the PNG Air Transport industry stakeholders in relation to the security issue and economic efficiency?

- 4) What are the criteria for assessing the security issue within the PNG Air Transport industry and in particular related to the overall economic efficiency of the PNG Air Transport Industry?
- 5) What are the constraints of the PNG Government and the PNG Air Transport industry stakeholders in relation to the security issue and in particular related to the overall economic efficiency of the PNG Air Transport Industry?
- 6) What are the policy alternatives available that the PNG Government can utilise in realising their objectives taking into account the security issue?
- 7) What are the benefits, cost and risks of the policy alternatives that the PNG Government can utilise in realising their objectives taking into account the security issue and in particular related to the overall economic efficiency of the PNG Air Transport Industry?

Figure 2. Abstract System Analysis Diagram of Security Issue in PNG Air Transport Industry.

