Document of the Inter-American Development Bank

**Bahamas**

**Government Digital Transformation to Strengthen Competitiveness**

**(BH-L1045)**

**Economic Analysis**

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1. Introduction
   1. The present document presents an ex ante economic analysis of the Government Digital Transformation to Strengthen Competitiveness (“the program”) (BH-L1045), planned to be executed in the period 2018-2023. The methodology used was cost-benefit analysis.
   2. The main objective of the program is to foster the competitiveness of The Bahamas by reducing the costs of conducting business with the government. This general objective will be accomplished by achieving the following specific objectives: (i) streamlining government procedures and making them available online to reduce the cost of government bureaucracy; (ii) increasing the use of ICTs in the public sector; and (iii) increasing transparency of government activities and strengthening auditing and control mechanisms.
   3. The expected impact is the reduction of time spent by businesspeople doing government procedures.
   4. The program is structured in the following components: (i) Simplifying and digitizing government procedures (US$13.8 million); (ii) Strengthening institutional capacity for a digital government (US$9.9 million); (iii) Enhancing transparency and integrity in government (US$3 million). Project management, monitoring, evaluation, audit and contingences amount at US$3.3 million.The results matrix, included in the POD, indicates the corresponding variables, indicators, baseline and target values. The economic analysis is associated with two indicators from the results matrix: (i) People obtaining a certified copy of birth registration online; and (ii) government Institutions connected to the interoperability platform.
2. Assumptions and Methodology
   1. To quantify the economic benefits produced by the program, five types of savings were analyzed: (i) use of online services, of services not currently online and increased use of the online option for services currently available online; (ii) elimination of required transactions; (iii) reduced government expenditure on staff to attend in-person service requests;[[1]](#footnote-1) (iv) reduced government expenditure on staff to conduct data exchange among government agencies; and (v) reduced government expenditure on paper and ink. Three sources of information were used: administrative data (on the availability and use of online services as well as government expenditure on different cost centers), interviews with government personnel (to quantify staff time dedicated to different tasks), and citizen surveys (to quantify time and transport burden in accessing government services).
   2. Thirteen different services at four different government agencies were studied. This approach is necessarily conservative in terms of cost-benefit estimates, as the government has approximately 90 different agencies and nearly 400 services, many of which will be benefited by the program – not only the 13 services and four agencies analyzed herein. The agencies and services analyzed include:
      1. **Registrar General’s Department:** birth registration, death certification, marriage license, Certificate of Good Standing.
      2. **National Insurance Board:** pensioner life verification; new registration of employers & self-employed persons, new registration of insured persons, benefit & assistance claims.
      3. **Inland Revenue Department:** Value Added Tax payment, business license renewal, property tax payment, business registration.
      4. **Road Traffic Department:** Driver’s license renewal.
   3. At each agency, the following data was gathered:
      1. Transactional services offered.
      2. Current and potential future online availability (to start or complete online).
      3. Current online usage as a percentage of total service requests.
      4. Front-line staff involved in delivering the service to citizens.
      5. Back-office staff involved in inter-agency data exchange necessary for service delivery.
   4. Additionally, to establish a baseline for the costs citizens currently face when accessing public services (the “without project” scenario), a survey was conducted of 19 citizens completing a variety of services at the Registrar General’s Department. The survey gathered the following information:
      1. Service requested.
      2. Number of trips to the office required to obtain the service.
      3. Mode of transportation used.
      4. Time spent in transport.
      5. Time spent in the office.
   5. The calculation of the benefits derived from the interventions supported by the program were based on a number of assumptions. The assumptions can be divided into those applicable to all calculations, those applicable to benefits of online service provision, and those applicable to benefits of interoperability.
   6. The assumptions applicable to all calculations include:
      1. Discount rate is 12% as per IDB standard practice.
      2. Demand for transactional services increases at the same rate as population growth (approximately 1.06% per year).[[2]](#footnote-2)
      3. Benefits are accrued over a 20-year period.
   7. The assumptions applicable to the calculations of benefits to citizens of online services and interoperability (including those services not yet online and those currently online whose use is expected to increase due to the program), are based on interviews conducted at the RGD unless otherwise noted. They include:
      1. The average number of visits that citizens have to make the government office is 2.
      2. The transportation cost is US$1.25 each way (equivalent to local bus fare).
      3. The average time spent in the government office per trip is 16 minutes.
      4. The average time spent in transportation per trip is 32 minutes (round trip).
      5. The total time necessary to complete an online transaction is 30 minutes.
      6. Opportunity cost is equivalent to minimum wage (US$5.25 per hour).[[3]](#footnote-3)
      7. Uptake of services put online will start at 20% per year and increase 20% each year until reaching a maximum of 67%.[[4]](#footnote-4)
      8. Uptake of services currently available online will increase up to a maximum of 70%.
      9. Services will begin to go online in year 2 of the project.
   8. A separate set of assumptions are made for the segment of Benefit 2 pertaining to the reduction in birth certificate requests:
      1. Birth certificate requests are distributed evenly among all public institutions.
      2. 75% of all birth certificate requests are for use with public institutions, and 25% are for use with private institutions.
      3. The government will not continue connecting institutions to the interoperability platform beyond project closure.
   9. The assumptions applicable to the calculation of benefits for government institutions derived through interoperability include:
      1. The average annual salary of a front-line staff is US$23,000.[[5]](#footnote-5)
      2. The average annual salary of a supervisor is US$30,000.
      3. The interoperability platform will be functional for the institutions analyzed starting in year 2 of the project.
   10. The one assumption pertaining to the costs analyzed is that the operational expenses of implementing and maintaining the systems and tools necessary to produce the benefits are included in the program expenditures.
   11. The following section describes the benefits derived from the five changes mentioned previously: (i) use of online services, of services not currently online and increased use of the online option for services currently available online; (ii) elimination of required transactions; (iii) reduced government expenditure on staff to attend in-person service requests; (iv) reduced government expenditure on staff to conduct data exchange among government agencies; and (v) reduced government expenditure on paper and ink.
   12. **Benefit 1: Use of online services not currently online and increased use of the online option for services already available online:** Table 1 below presents the services analyzed and their 2017 volume. The \* symbol indicates that the service is already available online, and that the “volume” statistic refers to the volume not conducted online.

**Table 1. Services Not Currently Conducted Online**

|  |  |
| --- | --- |
| **Service** | **Volume** |
| ***Registrar General Department*** | |
| Birth, death and marriage certificates | 9,747 |
| Good standing letter | 7,530 |
| Other company services | 4,989 |
| Deeds search payments | 22,900 |
| Birth certificate copies | 31,200 |
| ***National Insurance Board*** | |
| New registration of employers & self-employed persons | 8,215 |
| New registration of insured persons | 8,176 |
| Benefit & assistance claims | 43,360 |
| ***Road Traffic*** | |
| Driver's license renewal | 50,000 |
| ***Inland Revenue*** | |
| VAT payment | 9,954 |
| Business license | 7,592 |
| Property tax payment | 24,019 |
| Business registration | 1,308 |

* 1. Table 2 below presents a comparison of the costs faced by citizens in in-person provision versus online provision, assuming that the service can be completed online. The savings are derived primarily from a reduction or elimination in transport time, and secondarily from a marginal reduction in office (or website) time.

**Table 2. In-person vs. Online provision – Costs for Citizens**

| **Item** | **In-person** | **Online** |
| --- | --- | --- |
| Transport time | 65 minutes / US$5.72 | 0 |
| Office (website) time | 32 minutes / US$2.82 | 30 minutes / US$2.63 |
| Transport cost | US$5 (2 round trips) | 0 |
| Total average cost | US$13.54 | US$2.63 |
| Savings | US$10.91 | |

Source: Government of Bahamas, RGD survey.

* 1. There are several cases of services from the RGD in which the analysis does not assume that the service will be able to be completed online. This includes the birth, death and marriage certificates, the good standing letter, and other company services. In these cases, it is assumed that in the future the citizen will be able to request the service online but must go to the office to pick up the corresponding documentation.
  2. **Benefit 2: elimination of required transactions**. Two services were analyzed for this benefit: pensioner life verification of the National Insurance Board, and birth certificate copy request of the RGD. The pensioner life verification of the National Insurance Board is a requirement of all Bahamian NIB pension recipients: they must show up in person at an NIB office to prove that they are still alive and thus eligible to continue receiving pension benefits. Through the interoperability platform, the NIB will be able to learn which of its beneficiaries have passed via a connection with the RGD and the morgues, thus eliminating the necessity for pensioners to conduct this transaction. There are 36,000 beneficiaries of the NIB pension and each must show up twice per year. Assuming that a pensioner’s opportunity cost is slightly less (75%) than that of a working person (though still not zero, as he or she may still work or contribute to productive activities such as childcare), and that this transaction only requires one trip, the overall savings from eliminating this requirement would be:

72,000 (annual volume)\*$3.20 (opportunity cost)\*$2.50 (transport cost) = $410,530.

* 1. The birth certificate requests are assumed to decline also thanks to interoperability. Given that a portion of birth certificate copies are requested for procedures with government institutions, as more government institutions are able to request this information via the interoperability platform, citizens will need fewer of this document. The benefits accrued are thus calculated as the time and transport savings from birth certificate copies not requested. Table 3 presents a summarized flow of benefits accrued through this change.

**Table 3. Savings from birth certificates not requested**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **1** | **2** | **3** | **4** | **5** | **6** | **20** |
| birth certificates not requested | 0 | 2,124 | 4,294 | 6,509 | 8,771 | 11,080 | 12,845 |
| savings | 0 | $28,760.23 | $58,130.89 | $88,121.72 | $118,742.55 | $150,003.39 | $173,894.89 |

* 1. **Benefit 3: reduced government expenditure on staff to attend in-person service requests**. The analysis contemplated expenditure on staff that provide in-person attention at three agencies:
     1. Inland Revenue: 3 staff process property tax payments.
     2. RGD: 14 staff process a variety of requests for individuals and businesses.
     3. Road Traffic: 8 staff process driver’s license renewals.
  2. The savings on these staff is assumed, for simplicity, to be directly proportional to the percentage of services requested online (the underlying logic being that any time not dedicated to attending to a customer in person can be reassigned to a different task). The current annual expenditure on these staff is US$596,000.
  3. **Benefit 4: reduced government expenditure on staff to conduct data exchange among government agencies**. Currently, a number of government personnel are dedicated to exchanging information among government agencies through Excel spreadsheets or other labor-intensive means. The program will support the installation of an interoperability platform to automate the exchange of information between government agencies, thus drastically reducing the need to spend staff resources on this task. Additionally, it will finance other automation improvements, limiting the necessity of manual intervention. The analysis considered personnel from two agencies involved in such tasks:
     1. **Inland revenue**: 40 staff dedicated to data exchange and processing of tax compliance certificates, refunds and amendments, and business license applications and renewals.
     2. **National Insurance Board**: 11 staff dedicated to pensioner life verification and data exchange for business license renewals.
  4. The savings on these staff will be nearly immediate following the connection and programming of the interoperability platform. The current annual expenditure on these staff is US$1.126 million.
  5. **Benefit 5: reduced government expenditure on paper and ink**. As more services are conducted online, and interoperability reduces the need for citizens to present physical proof of different documents, government will need less paper and ink to produce such documents. An indicative analysis of RGD found that current annual expenditure on paper and ink is approximately USD$238,200. The savings on this item are assumed to be proportional to the rate of uptake of online services.
  6. **Costs.** The costs included in the analysis are those of Components 1 and 2, as well as the Project Management and Evaluation for a total of US$27 million. The costs of Component 3 are not contemplated, as the activities of Component 3 are not related to the putting of services online or the installation of the interoperability platform – the two main interventions that generate the savings analyzed herein. The costs are projected to be incurred along the following timeline:

**Table 4. Costs Flow (in millions of US$)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** | **Subtotal** |
| Subtotal Components 1 + 2 | 3.309 | 7.699 | 7.203 | 4.316 | 2.473 | 2.0 | 27 |

* 1. **Component 1. Simplifying and digitizing government procedures (US$13,800,000).** The main objective of this component is to streamline government procedures and make them available online. This component will finance the following activities: (i) updating the catalogue of government procedures, prioritizing[[6]](#footnote-6) and simplifying them, (including reengineering current procedures, eliminating unnecessary ones and putting them in a BPM (Business Process Manager)); (ii) updating the legal framework[[7]](#footnote-7) related to the provision of digital services including the drafting of new legislation; (iii) designing and implementing a government cloud computing service that will allow other government agencies to access a shared e-government infrastructure and applications; (iv) setting up an interoperability scheme including standards, regulation and technological platform; (v) updating the citizen portal and putting online government procedures[[8]](#footnote-8), implementing the key tools for the provision of government digital services -digital identity, digital signature, online payment, BPM, document management;[[9]](#footnote-9) (vi) digitizing government procedures related to property registration;[[10]](#footnote-10) (vii) computerizing government procedures related to setting-up a business;[[11]](#footnote-11) and (viii) supporting the use of the National Insurance Board (NIB) database to provide digital citizen identification for government procedures.[[12]](#footnote-12)
  2. **Component 2. Strengthening institutional capacity for a digital government (US$9,900,000).** The main objective of this component is to increase the use of ICTs in the public sector. This component will finance the following activities: (i) designing and implementing an institutional framework to manage digital government;[[13]](#footnote-13) (ii) setting up the government Chief Information Officer (CIO) role and professionalizing ICT in the public sector including the training plans; (iii) updating the government ICT blueprint (including a roadmap and action plan for ICT transformation in the government);[[14]](#footnote-14) (iv) setting up an ICT fund to support ICT-based strategic innovations across government;[[15]](#footnote-15) (v) implementing an ICT skills gap assessment and, based on it, designing and implementing a plan to close the gap by adding new employees and training existing ones;[[16]](#footnote-16) (vi) designing and implementing a change management plan;[[17]](#footnote-17) (vii) undertaking a digital literacy program for citizens and small businesses not familiarized with most used digital tools;[[18]](#footnote-18) (viii) implementing a communications strategy to create citizens and businesses awareness;[[19]](#footnote-19) (ix) setting up a data culture and a data analytics office that will initially serve the whole government and will be subsequently extended to key ministries;[[20]](#footnote-20) (x) designing and implementing a cybersecurity strategy;[[21]](#footnote-21) and (xi) Information Technology (IT) project management and supervision for all IT implementation projects.[[22]](#footnote-22)
  3. **Estimates:** The first quantification required for the analysis consists of estimating the annual benefits of the five types of savings described above. The following formula was applied for each year with the indicated discount rate. To estimate the total benefits for each year, over a period of 20 years, by using the following formula:

where refers that the sum of the benefits by year and refers to the current year.

* 1. The operational cost was calculated as the present value of the expenses flow of the program. The formula used was:

Where g is the annual expense of the current period. The total cost contemplated is US$24.2 million, which corresponds to the costs for Components 1 and 2 of the program.

1. Results, sensitivity analysis and discussion
   1. This section presents the calculations describing the alternative scenarios. The variables considered in the analysis are the rate of online uptake and the year in which the interoperability platform is connected. In the base scenario, online uptake starts at 20% in year 2 of the program and increases gradually each year, up to a maximum of 70% by year 6[[23]](#footnote-23), and the interoperability platform is connected in year 2 of the program. In the conservative scenario, online uptake starts at 20% and increases 10 percentage points per year until reaching a maximum of 70% in year 7, and the interoperability platform is connected in year 3. The optimistic scenario is the same as the base scenario, with the exception that the maximum digital uptake is set at 80%.

**Table 5. Results and Sensitivity Analysis**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Scenarios** | | |
| **Conservative** | **Base** | **Optimistic** |
| **Net Present Value** | $925,925 | $2,576,109 | $4,487,919 |
| **Internal Rate of Return** | 12.83% | 14.55% | 16.35% |
| **Benefit-cost ratio** | 1.10 | 1.19 | 1.30 |

In the base scenario, the benefit-cost ratio for the program is 1.10, indicating that it is expected to recover US$1.10 for each dollar invested, with an internal rate return of 14.55%. For the conservative scenario, the IRR is 12.83% and the benefit-cost ratio is 1.10. This indicates that even when considering only a small subset of the government services (13 of nearly 400) and agencies (4 of approximately 90) benefited, this program will generate positive returns.

1. This project does not entail public sector retrenchment. Therefore, “reduced government expenditure on staff” as calculated under points (iii) and (iv) in this Economic Analysis refers to expenditure specifically pertaining to tasks that will be made more efficient. The underlying assumption is that the staff time liberated by these efficiency gains will be redistributed to other tasks, for which the government would have otherwise needed to make an additional budgetary outlay. [↑](#footnote-ref-1)
2. Source: [www.worldometers.com](http://www.worldometers.com). [↑](#footnote-ref-2)
3. Source: <https://www.minimum-wage.org/international/the-bahamas>. [↑](#footnote-ref-3)
4. The precedent for this assumption is the experience of Inland Revenue with its online services. The VAT payment was made available online in 2016 and is currently conducted 67% via the web. [↑](#footnote-ref-4)
5. Source: interviews with staff of RGD, Inland Revenue and National Insurance Board [↑](#footnote-ref-5)
6. Government procedures included in the Doing Business Report have already been prioritized by the government. Other procedures to be simplified and placed online will be prioritized in consultation with citizens. Within families, usually women take more responsibility to undertake government procedures required to exercise rights, comply with obligations or access to benefits. In order to save women time wasted dealing with government bureaucracy, in the selection of government procedures to be simplified, those more frequently used by women will be prioritized. [↑](#footnote-ref-6)
7. The most relevant current legislation related to digital government is: Electronic Communications and Transactions Act (2006), Computer Misuse Act (2006) and Data Protection Act (2008). This current legal framework allows the implementation of the activities proposed in this project, however as the execution progresses it will be recommended to update the legislation to put the citizen at the center of digital government and to create a more secure cyberspace. It is anticipated that a digital government act, a cybersecurity act and an updated Data Protection Act will be drafted during the implementation of this project. [↑](#footnote-ref-7)
8. This process will be done through a multi-channel mechanism that includes access via counter, phone, website and mobile platforms. [↑](#footnote-ref-8)
9. In addition to its impact in the reduction of costs for companies and citizens of conducting business with government, the project will have a positive impact in the environment by reducing the amount of paper necessary to complete a government transaction and decreasing CO2 emissions by eliminating traffic related to the compliance with the bureaucratic requirements. Details provided in the Key Results Indicator chapter. [↑](#footnote-ref-9)
10. This activity includes: reviewing and improving the institutional framework, regulation and procedures related to property registration and conveyancing (including digitization of documents and Geographic Information Systems (GIS), cadaster, interoperability among registries, an a blockchain pilot project). [↑](#footnote-ref-10)
11. This activity includes: implementing one-stop-shop for business, a multichannel strategy (that will allow agile access both online and offline) and customer relationship management that will allow the tracking of the different steps in the procedure. [↑](#footnote-ref-11)
12. NIB has a digital database with 70% of the population registered (all those above 16 years old and most from 0 to 3 years old). NIB is already providing digital access to its database to the National Health Insurance (NHI) for identification purposes. The country is currently using the NID card as a means to identify people doing government procedures. This project has not been designed to generate a new identification mechanism but rather to use the current one more efficiently by allowing government institutions that need to identify people undertaking government procedures to do so online through the interoperability platform. [↑](#footnote-ref-12)
13. On July 2011, Cabinet approved Memorandum “2nd update on e-Government implementation project and approval to establish the Department of Information Technology” submitted by the Minister of Finance. This memorandum sets up, among other institutional aspects: The Department of Information Technology, the government CIO, ministerial CIOs, the CIO Forum and the Government ICT Committee (GIC). Out of this list, just the Department of Information Technology is currently in operation. [↑](#footnote-ref-13)
14. This blueprint will be both a planning and marketing document helping to get the buy-in of all relevant stakeholders. It will be updated periodically and foster the sustainability of the digital government in The Bahamas beyond this operation. [↑](#footnote-ref-14)
15. The fund will support 4 projects per year that the Project Steering Committee deems as a strategic for the advancement of digital government in The Bahamas based on its innovation, its impact in citizens and businesses and its applicability to the government as whole. [↑](#footnote-ref-15)
16. Resources to be invested in closing the ICT gap analysis will cover part of the plan. The project includes resources for training as well as for incorporating ICT professionals deemed as necessary after the gap analysis is finalized. [↑](#footnote-ref-16)
17. The Change Management Plan is complemented with the hiring of a Change Management Specialist that will be part of the PEU. As indicated in the Results Matrix, the plan will include targeted annual activities focused on the institutions considered key for the success of this project (Registrar Office, Attorney General Office, Auditor General Office, Department of Inland Revenue and National Insurance Board). Other institutions will participate government-wide activities. Change management activities will be conducted in Grand Bahama and Abaco, in addition to New Providence. [↑](#footnote-ref-17)
18. When selecting the participants in the digital literacy activity, women will be given priority to assure at least an equal representation. [↑](#footnote-ref-18)
19. The communication strategy will include actions for internal communication at three main levels of responsibility (policy-strategy, management and operations), as well as external communications focus on reaching out to citizens and businesses. [↑](#footnote-ref-19)
20. This activity includes the hiring of a data analytics expert, the provision of training to on data analytics to different government branches as well as the implementation of several practical cases of the use of data to support policy implementation. [↑](#footnote-ref-20)
21. This activity includes the following actions: (i) review the present situation of cybersecurity of The Bahamas Agencies and identify gaps and deficiencies; (ii) prepare a cybersecurity strategy based on the situation assessment; (iii) set up a CERT (Computer Emergency Response Team); (iv) strengthen the Police Cyberforensics Laboratory; (v) provide training on cybersecurity to government employees, law enforcement agents and judicial authority professionals, and (vi) design and implement a citizen sensitization campaign. [↑](#footnote-ref-21)
22. This is a highly specialized consulting service aimed at supervising the deployment of IT projects in order to assure the compliance with quality and standards agreed upon contractually. [↑](#footnote-ref-22)
23. Adoption rate: Year 1 – 0%, 2 – 20%, 3 – 40%, 4 – 50%, 5 – 60%, 6 – 70%. [↑](#footnote-ref-23)