


**COMMUNICATING
VISUALLY WITH
IMPACT**

SEPTEMBER 2019

 INTRODUCTION

 TECHNIQUES

 KEY LESSONS

 EXAMPLES

XV CEMLA Meeting of central Bank Internal Auditors

BANK OF CANADA



**“ It's all about brand and how they
perceive us.”**

- Larry Harrington, vice president of internal audit @ Raytheon

**“We have a lot to do to respond to the
voice of our customers and to the voice of
our stakeholders.”**

- Angela Witzany, head of internal audit @ Sparkassen Versicherung AG

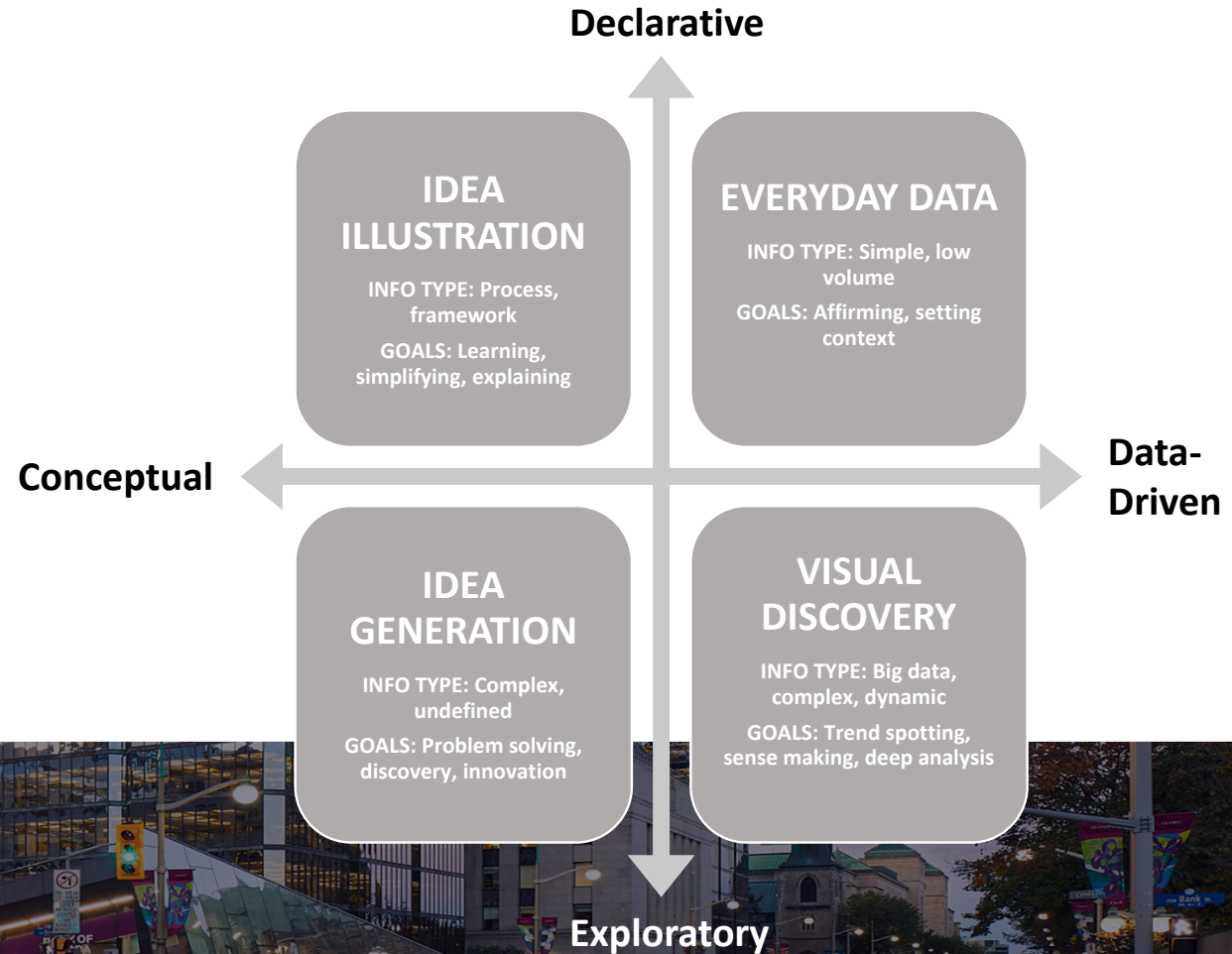
TECHNIQUES - HARVARD BUSINESS REVIEW CONCEPTS

“To start thinking visually, consider the nature and purpose of your visualization.”

1. Ask yourself:

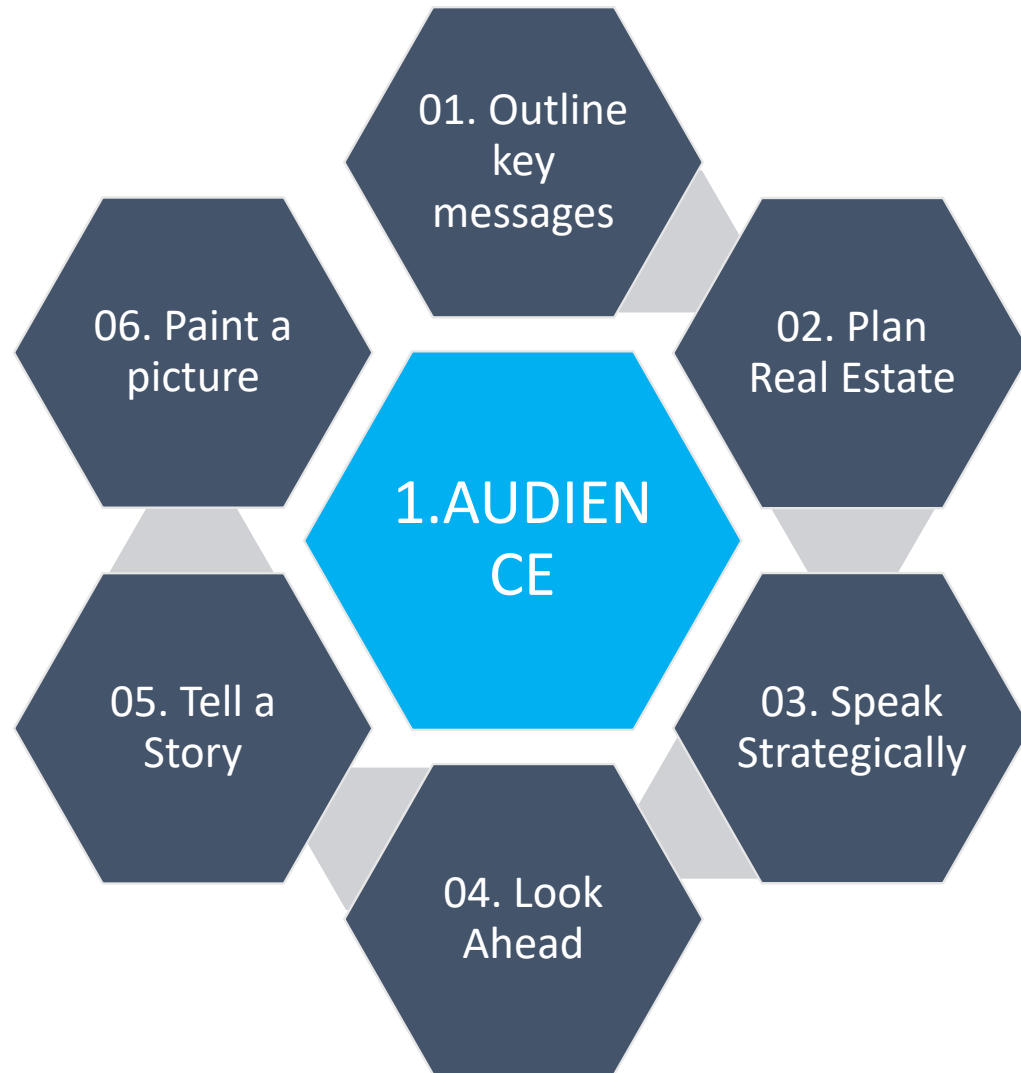
- Is the information **conceptual** or **data-driven**?
- Am I **declaring** something or **exploring** something?

2. Plot the Answer





LESSONS FROM THE BANK OF CANADA





EXAMPLES @ BANK OF CANADA

2019-2021 Internal Audit Plan

December 6, 2018

Our focus in 2019



*Deliver assurance over foundational controls
and in areas of high importance*

*Support strategic and transformation
initiatives*

Maintain quality performance

*Build flexibility into prioritization and
engagement delivery*

*Strengthen data analytics capabilities to
generate insights and solve problems*

We are a leading Central Bank internal audit team—*trusted, agile and engaged*—protecting the Bank's interests and contributing *strategically and dynamically* to its *excellence*.

TABLE OF CONTENT

2019-2021 INTERNAL AUDIT PLAN

EXECUTIVE SUMMARY	2
AUDIT PLAN FOCUS, BANK PRIORITIES AND RISK CONTEXT	3
COVERAGE BY FUNCTIONAL AREA	6
QUALITY ASSURANCE AND IMPROVEMENT PROGRAM	7
AUDIT RESOURCES – FINANCIAL AND HUMAN RESOURCES	7
RISKS TO THE ACCOMPLISHMENT OF THE PLAN	8

Appendices

Appendix I Full Listing of Audit Activities for 2019 and 2020-2021

Appendix II Internal Audit Coverage of Foundational Financial Reporting Controls

Appendix III Internal Audit Coverage – Past (2015-2018) and planned (2019-2021) by Function

Appendix IV Quality Assurance and Improvement Program Initiatives

EXECUTIVE SUMMARY

Our three-year Audit Plan (Plan) is influenced by the Bank's key priorities outlined in the 2019-2021 Medium-Term Plan (MTP). Our involvement on key committees positions us to understand the business, its risks, and their evolution. Consultations with management and Enterprise Risk Management (ERM) have confirmed that our Plan is focused on current and forward-looking conditions and risks.

Our proposed activities, fully listed in Appendix I, cover areas of importance:

- providing assurance that **foundational controls** remain robust;
- assessing **operational and IT controls** for the current business and risk context;
- proactively providing **strategic** and value-added advisory services;
- reviewing and advising on **third-party control reports** on key outsourced services; and
- strengthening our **Quality Assurance and Improvement Program (QAIP)** to continuously monitor our effectiveness and enhance our internal audit practices.

For 2019, both traditional and new themes emerged during consultations and environmental scanning that will drive the direction of our assurance and advisory activities:

Security, Resilience and Business Continuity – the ability to prevent, detect and recover from both cyber and physical security threats is critical given our role in the financial system as Canada's central bank. Programs, projects, and operational areas continue to enhance processes, build resilient systems and infrastructures, and increase organizational awareness. Many assurance and advisory engagements focus on this risk area.

Risk Management – second line of defence functions continue to develop frameworks, processes and tools that will serve to better support the Bank in managing all aspects of risk such as strategic, financial, and operational risks, including exposure from our dependency on third parties. Industry certifications and compliance attestations are becoming more common, requiring supporting assurance or advice from internal audit.

Transformation and Renewal of Critical Systems – many system modernization initiatives are underway across the organization. Internal audit supports the preliminary identification and subsequent assessments of benefits to be realized for the larger initiatives, and, in some cases completes pre-implementation audits to assess the design of controls considering business process, information technology, and security risks.

Data and Information Governance – data and information are important in a knowledge-based organization focused on policy development, research and innovation. At the same time, applying proper data governance, maximizing the value extracted from data, and complying with regulations are ever-present considerations. Efforts are underway to establish a governance framework, strategy, processes and infrastructures that will support timely access to high quality data, information and tools. Audit will play a key advisory role in this area throughout our Plan.

Drawing from our experience, industry best practice and our recent external quality assessment, we will also dedicate additional efforts to support:

- 1) **Building flexibility** into audit prioritization processes, and on delivering engagements using an adaptable and iterative approach.
- 2) **Strengthening data analytics capabilities** to generate insights and solve problems, for example: supporting the second line of defence in developing monitoring capabilities, enhancing audit coverage and gaining efficiencies through increased automation of audit testing, and supporting trend identification and risk insight.



Our plan will be carried out by our *trusted* and *agile* audit team complemented by consultants. We will continue to **monitor risks to the completion of our plan and ensure its relevance** through our involvement in committees, our relationships with management, and our partnership with the Chief Risk Officer (CRO), adjusting as needed. Any significant changes to our Plan will be proposed for review by the Office of the Governor and approval by the Audit and Finance Committee.

Key Initiatives or Business Objectives

2019 Planned Audit Activities

<i>Security, Resilience and Business Continuity</i>	<i>Assurance Engagements</i>	<i>Advisory Engagements</i>
<ul style="list-style-type: none"> • There are several large programs designed to increase the Bank's resilience and business continuity posture, as well as ongoing operations. These include: Business Recovery Enhancement (BRE), Resilience for Market & Banking Operations (RMBO), Cyber Security program. • The Continuity of Operations Incident Management and Response work stream is building capacity to lead a Bank-wide exercise. 	<ul style="list-style-type: none"> • Enterprise Security System (2018) • Vulnerability Management (2018) • Operational Disaster Recovery Test • Identity & Privileged Access Management – Access Governance • Data Centre (DC3) • BRE Early Adopter (system TBD) • Currency Continuity of Operations 	<ul style="list-style-type: none"> • BRE Monitoring • Cyber Security Monitoring • Corporate Security Access Management and Screening Renewal • Continuity of Operations (COOP) review • Physical Security Review: Calgary
<p><i>Risk Management</i></p> <ul style="list-style-type: none"> • Developing controls to comply with the SWIFT Customer Security Program whose objectives are to secure the environment, restrict access, and detect/respond to suspicious activities or incidents. • The Bank has made a statement of commitment to the FX Global Code, which is a set of global principles supporting integrity and effective functioning of the wholesale foreign exchange market. 	<ul style="list-style-type: none"> • SWIFT Certification • FX Global Code Compliance 	<ul style="list-style-type: none"> • Financial Market Infrastructure (FMI) Resolution Governance • Third-party Control for Activities Related to Physical Safeguarding Services • Development of Third Party Risk Management Framework
<p><i>Transformation & Renewal of Critical Systems</i></p> <ul style="list-style-type: none"> • Payments Modernization is a multi-year Payments Canada initiative to modernize Canada's payment ecosystems. The Bank plays a systems oversight role and will modify its own systems and processes to integrate with the deployed technology. • Strategic initiatives are underway to transform or replace aging technology: Auction Modernization (AMI), Findur Program, Centralized Cash Manager System in AOC Modernization, Enterprise Service Management Integration (ESMI) project and Partner Secure Remote Access (PSRA) for identity and access management. 	<ul style="list-style-type: none"> • Payments Canada Modernization – Bank's operations and system changes • AMI System Implementation • Centralized Cash Manager System Implementation • ESMI System Implementation • Partner Secure Remote Access (PSRA) System Implementation 	<ul style="list-style-type: none"> • Payments Modernization Monitoring
<p><i>Data & Information Governance</i></p> <ul style="list-style-type: none"> • The Data Strategy will promote a culture of data driven decision making through investments in Big Data and advanced analytic capabilities. • The Digital Analytic Zone (DAZ) is planned to offer a Protected-B categorized cloud environment where staff can experiment with new ideas while engaging with external vendors and researchers. • Partnerships in Innovation and Technology Program (PIVOT) will work with the private sector and academia to experiment with digital tools and technologies, such as artificial intelligence and machine learning. 	<ul style="list-style-type: none"> • Management of Sensitive Information and Assets in Currency (2018) • Protected B Cloud Environment 	<ul style="list-style-type: none"> • AI translation tool pilot • Data analytic support for Accounts Payable, Expense Claims and Procurement (P-cards) • Records & Email Management • PIVOT

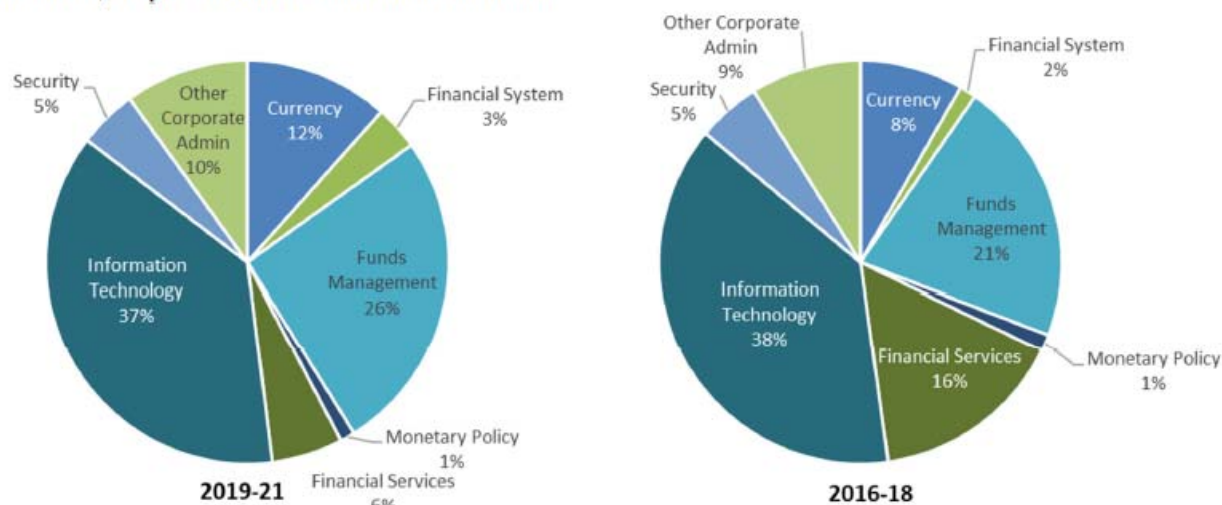
COVERAGE BY FUNCTIONAL AREA

Before finalizing our Plan, we take into consideration the balanced coverage of key processes and activities by function/departments, as well as related risks (including risk of fraud and corruption). This includes taking into consideration second line of defence monitoring and oversight activities as well as working with, and relying on, other assurance providers.

Overall, plan-over-plan coverage outlined below is similar, with our efforts aligned with key processes and areas of risks such as information technology processes. An overview of coverage for each function is included in **Appendix III**.

A few key highlights:

- **Currency:** The increase is mainly attributable to the Agency Operation Centre (AOC) Modernization project that includes the Centralized Cash Manager system implementation.
- **Monetary Policy and Financial Systems:** While significantly important to the Bank, the nature of their key processes do not warrant annual audits. Coverage of main activities is planned over a three to five-year cycle.
- **Funds Management:** The increase is partially due to audits of key phases of the Auction Modernization Initiative (AMI) that are planned over 2019-2021, as well as the reclassification of the Investments audit (see Financial Services).
- **Financial Services:** We have created some efficiencies by grouping our annual audit of Investments, which was previously shown under Financial Services, with our audit of Banking Operations included in Funds Management. The prior plan also included audits of several system implementations and process improvements in Financial Services.
- **Other Corporate Admin:** Various engagements are planned supporting risk management and key operational processes across departments including Human Resources, Corporate Services and Communications.



In conclusion, based on our analysis, our 2019-2021 Plan achieves the proper balance between functional areas, and core and administrative processes. We will continue to monitor and proactively assess the changing risk profiles of these areas and rebalance our planned activities, if required.

APPENDIX I – Full Listing of Audit Activities for 2020-21

Core Operations	<p>Foundational Financial Reporting Controls – Annual Financial Audits</p> <p><i>Bank financial statements (ICFR):</i></p> <ol style="list-style-type: none"> 1. Investment and Loans/Foreign Banking Services 2. Payroll and Pension 3. Expenditures and Other Payments 4. Financial Close, Reporting and Disclosure 5. Banking Operations/Client Safekeeping 6. Bank Notes <ol style="list-style-type: none"> 7. Government Debt 8. Exchange Fund Account <p><i>IT General Computer Controls of key systems and services:</i></p> <ol style="list-style-type: none"> 9. SAP 10. High Availability Banking System (HABS) 11. Agency Inventory Management System (AIMS) 12. Findur 13. Notes Exchange System (NES) 14. HABS – Oracle Internet Directory 15. Databases 16. Operating Systems 17. Change Management 18. Data Centres 	<p>Operational and IT Control Audits</p> <p><i>Priority Engagements for 2020-21</i></p> <ol style="list-style-type: none"> 19. Operational Disaster Recovery Test 20. Auction Modernization Initiative (AMI) System Implementation 21. Regulatory Reporting System 22. Enterprise Service Management Integration (ESMI) (config mgt database, config mgt processes, and automation/integration) 23. Business Recovery Enhancement (BRE) Transformation – Financial Reporting System (system TBD) 24. Information and Data Governance 25. AOC Modernization – Replacement of Note Processing Machines 26. Public Sector Accounting Board Implementation 27. Penetration Testing Governance and Operations 28. Data Analytics/Continuous Auditing Proof of Concept <p><i>Other Engagements for 2020-21</i></p> <ol style="list-style-type: none"> 29. Physical Safekeeping Services (specific procedures) 30. Model Risk Management Follow-Up (Bank-Wide) 31. BRE Security Tools and Operational Practices 32. Financial Crime Policy 33. Compliance Regulatory Framework Design 34. Internal Credit Rating 35. Balance Sheet Management 36. Macro Stress Testing 37. Emergency Lending Assistance (ELA) Policy & Liquidity Framework 38. Oversight of Financial Market Infrastructure (FMI) Cyber Security Risks 39. Human Resources Planning and Recruitment 40. Communication Planning and Performance Monitoring 41. Information Technology Security Incident Response Tool 42. Security Governance Risk and Control – Data Risks and System Implementation 43. Classified Threat Intelligence
	Advisory Activities	<p>Advisory Activities - Strategic Initiatives and Other Areas</p> <ol style="list-style-type: none"> 44. SWIFT Certification 45. Support for Retail Oversight Framework 46. AOC Modernization – New Note Preparation Capability 47. Bank Note Distribution System Review 48. Enterprise Risk Management Assessment <p>+Benefits realization reviews as well as monitoring activities over initiatives and key projects, as needed</p>
Internal Audit QAIP	<p>Key activities included in our Quality Assurance and Improvement Program:</p> <ul style="list-style-type: none"> • Internal Quality Review • Continuous Improvement Activities <ul style="list-style-type: none"> ◦ Technology enhancements/upgrades ◦ Networking/haiison activities • Internal Strategic Initiatives – to be defined in 2019 	

APPENDIX II - Internal Audit Coverage of Foundational Financial Reporting Controls

The ICFR program is under the responsibility of the Financial Policy and External Reporting (FPER) team in Finance. Internal Audit works with FPER to support the program by conducting annual audits of business processes (i.e. 100% of critical, high or medium risk processes) and both maintaining process documentation and performing testing of information technology general controls (i.e. 100% of information technology general controls). FPER performs the testing on most low-risk processes and entity-level controls.

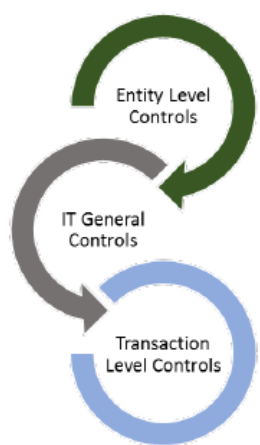
ENTITY LEVEL CONTROL TESTING

<p>...by FPER</p> <ul style="list-style-type: none"> Entity Level Controls Internal Financial Management Outsourced Service Provider Contract Controls 	<p>...by Internal Audit</p> <ul style="list-style-type: none"> Financial Close, Reporting & Disclosure Third party control reports review
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IT GENERAL CONTROLS TESTING

The diagram illustrates the IT General Controls Testing framework, centered around a computer monitor icon. It is divided into four main categories:

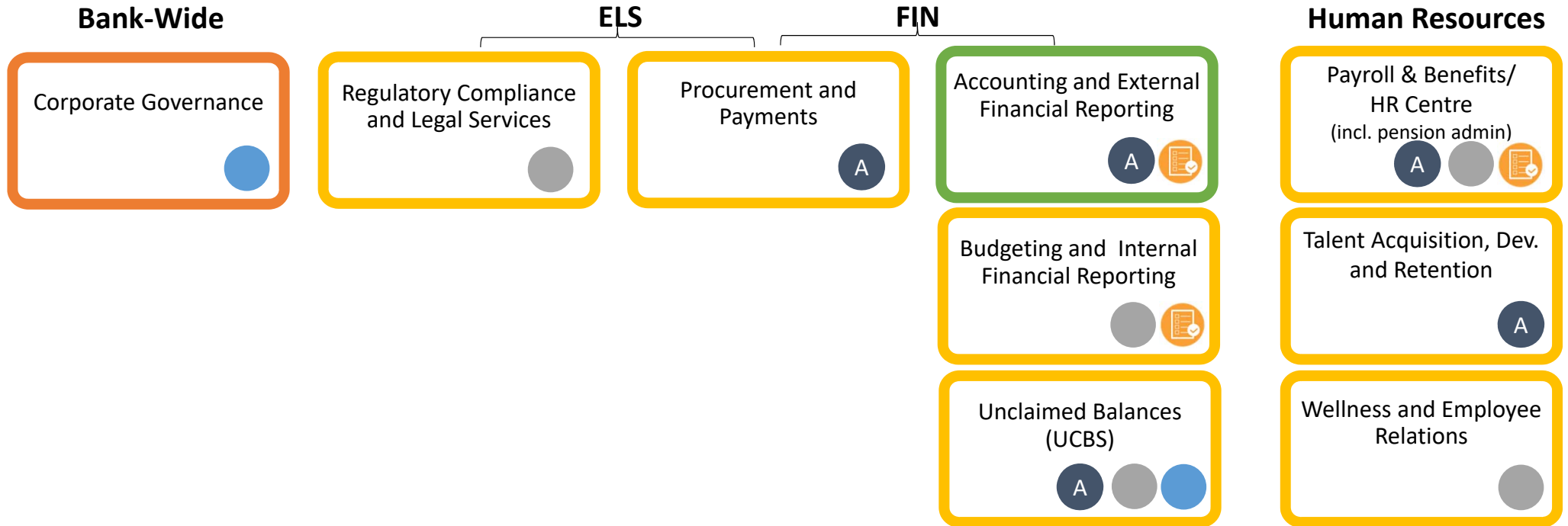
- Applications:** SAP, Findur, High Availability Banking System (HABS), Agency Inventory Management System (AIMS), Notes Exchange System (NES).
- Databases:** HANA – SAP, Oracle – Findur and HABS, SQL – AIMS and NES.
- Operating Systems:** UNIX (Findur and HABS), Linux (SAP and NES), Windows (AIMS and NES).
- External Systems and Platforms/Third Party Assurance:** LVTS, CDSX, ACSS and SWIFT.
- Infrastructure and Services:** Data Centre Physical Security, Change Management.



<h3>Statement of Financial Position</h3> <p>As at September 30, 2018</p> <ul style="list-style-type: none"> Cash & Foreign: \$17M Loans & Receivables: \$8,610M Investments (T-bills, Bonds, other): \$10,542M Capital & other assets: \$864M Bank Notes in Circulation: \$88,065M Deposits: \$25,740M Other Liabilities: \$604M Equity: \$502M 	<h3>TRANSACTION LEVEL CONTROL TESTING</h3> <ul style="list-style-type: none"> Investments and Loans/ Foreign Banking Services / Banking Operations Fixed Assets Tested by FPER Bank Notes Banking Operations Payroll & Pension / Expenditures & Other Payments 	<h3>Interim Statement of Net Income</h3> <p>For the nine-months ended September 30, 2018</p> <ul style="list-style-type: none"> Total Income: \$1,213M Deprec. & Amort. \$36M Bank Note Production: \$33M Staff Cost: \$208M Premise Cost: \$21M Technology & Comm. \$42M Other Operating: \$52M
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Internal Audit Coverage – CORPORATE ADMINISTRATION

Functional Objective: To guide the stewardship of our physical, information, technology and financial assets and help develop our people.



- Planned coverage (2018)
 - Corporate Governance (2nd line of defense)
 - Third-party Risk Management – Cyber
 - UCBS Implementation
- Annual audit
 - Financial Close, Reporting and Disclosure
 - Expenditures and Other Payments (incl. UCBS)
 - Payroll and Pension
 - Exchange Fund Account
 - Government Debt
- Past coverage (2014-2017)
 - Code of Conduct
 - Implementation of Adaptive Insights
 - UCBS Adjudication Processes
 - Success Factors Implementation (part of HR Modernization)
- Monitoring & advice
- External assurance/reports
 - External Financial Audits - Pension, Bank, EFA, Debt
 - 3rd party assurance:
 - Adaptive Insights
 - Pension (e.g., Morneau, CIBC Mellon)

Appendix IV: QUALITY ASSURANCE AND IMPROVEMENT PROGRAM INITIATIVES



Plans 2019

- Determine key information sources
- Establish a process for risk monitoring and intelligence gathering
- Restructure Audit's central information repository as required
- Establish an intake log
- Develop prioritization criteria
- Establish a periodic reassessment approach
- Refresh Audit Manual & Methodology
- Establish a data analytics strategy
- Pilot client-inclusive risk assessment approach
- Standardize reporting on Strategic Initiatives (including dashboard for audit's advisory work)
- Formalize Agile project audit methodology
- Establish relationship management strategy & framework
- Collaborate with 2nd line of defense
- Shadow an Audit Program
- Market Internal Audit via targeted presentations
- Client Collaboration Site
- Pilot observation tracking with clients
- Deploy observation tracking across Bank
- Develop 2019 WECU Plan
- Complete established EQA action plans
- Perform 2019 Internal Quality Assessment
- Assess new TeamMate capabilities
- Update templates to reflect updated methodology
- IIA– Global Financial Services Guidance Committee
- ISACA Ottawa Board – Director of Certification
- CBIA Working Groups and Conferences
- Crown Corp Roundtable

Pressures

Accomplishing the above-listed initiatives is highly dependent on having adequate capacity as completing the Audit Plan is our top priority. Vacancies and new requests are sources of pressure that we will monitor through regular Audit leadership meetings. We will adjust our efforts as needed to focus on areas of highest risk and impact and will inform Bank senior leadership and the Audit and Finance Committee of any needed changes.

Examples of Charts from our Progress Reports and Annual Report

Figure 1. Status of Planned Engagements

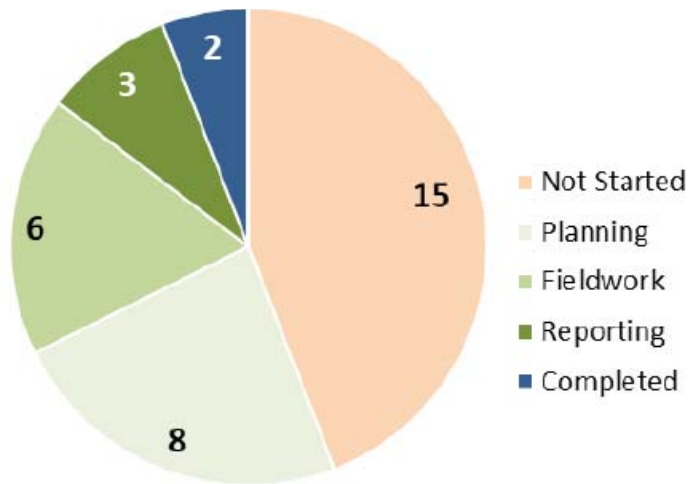


Figure 2. 2019 YTD versus Planned Effort at March 31, 2019 (in days)

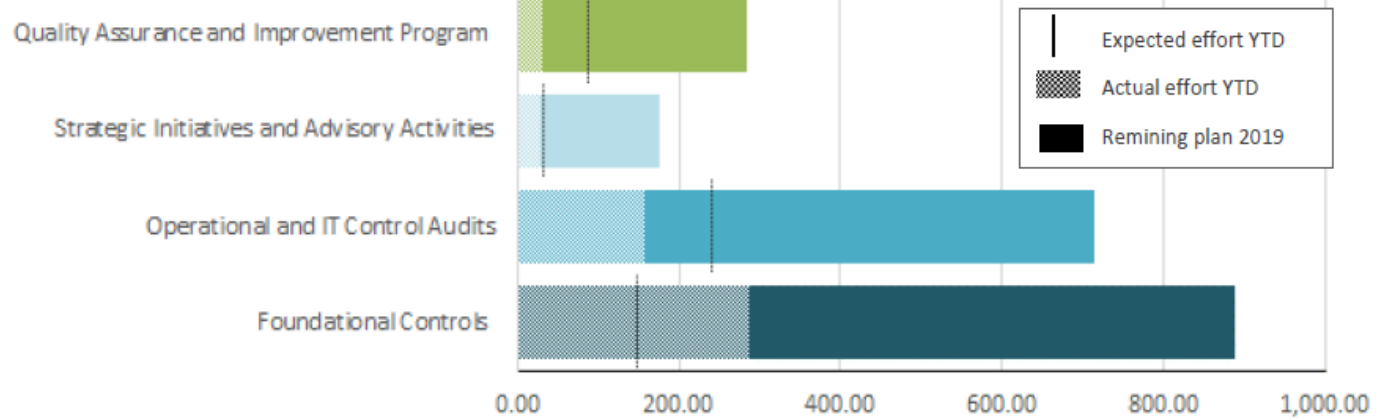


Figure 3. Status of Action Plans

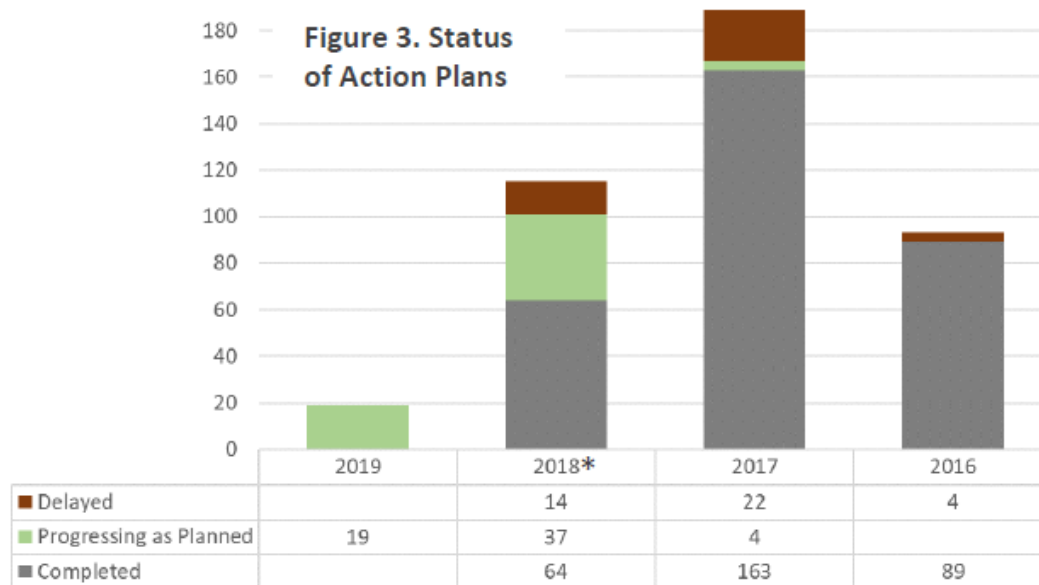


Figure 5. Results of Audit's WECU Pulse Check Survey in areas of Engagement, Leadership and selected Departmental Questions

