DESA PUBLIC FINANCE & PROCUREMENT INTEGRITY PROGRAMME

A Sovereign Framework for Transparent, Efficient, and Ethical Public Resource Management

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DESA Public Finance & Procurement Integrity Programme

Programme Fact Table

Field	Details
Programme Name	DESA Public Finance & Procurement Integrity Programme
Acronym	DPFIP
Mission Statement	Protect public resources through digital controls, auditability, and open standards.
Executive Summary	DPFIP is a strategic DESA programme designed to institutionalize transparency and efficiency in public finance and procurement systems. It leverages e-procurement platforms, open contracting data standards (OCDS), AI-driven anomaly detection, and vendor performance dashboards to reduce leakage, accelerate procurement cycles, and maximize value for money. Anchored in DESA's governance architecture, DPFIP aligns with Agenda 2063, Agenda 2074, AfDB High 5 priorities, and regional digitalisation strategies (COMESA, SADC, EAC). Its fiduciary model integrates blended finance instruments, results-based disbursements via DTIF, and independent audits, ensuring compliance with ethical, legal, and data protection standards. The programme is positioned as a scalable, sovereign solution for harmonized regional replication and interoperability.

Chapter 1: Programme Title and Acronym

The programme shall be formally designated as the DESA Public Finance & Procurement Integrity Programme (DPFIP). It constitutes a core instrument within the DESA portfolio, mandated to operationalize integrity, transparency, and efficiency in public financial management and procurement systems. DPFIP is conceived as a structural enabler of governance modernization, embedding digital controls, algorithmic transparency, and open contracting standards into national and regional frameworks.

The acronym DPFIP shall be used consistently across all official instruments, including Memoranda of Understanding (MoUs), Operating Circulars, and compliance documentation. Its identity is anchored in DESA's institutional governance architecture and shall be recognized as a sovereign programme under the Creativa Center mandate.

Chapter 2: Legal Mandate and Purpose

DPFIP derives its legal sufficiency from the DESA Institutional Governance Manual, the DESA Development Fund Charter, and the Unified Compliance Framework applicable to all DESA programmes. It is established as a mandatory programme for DESA implementations where public

finance and procurement constitute critical governance functions. In jurisdictions where DESA operates under elective modalities, DPFIP shall be strongly recommended as a priority instrument for fiduciary integrity and compliance alignment.

The programme's normative purpose is threefold:

1. **Safeguarding Public Resources**: Institutionalize digital controls and audit trails to prevent fiscal leakage, procurement fraud, and non-compliant disbursements.

2. **Accelerating Procurement Efficiency**: Deploy e-procurement platforms and contract registers to reduce cycle times and enhance competitive bidding.

3. **Embedding Transparency and Accountability**: Enforce open contracting data standards (OCDS), algorithmic explainability, and independent audit obligations to ensure public trust and donor confidence.

DPFIP is aligned with Agenda 2063: The Africa We Want, specifically its Second Ten-Year Implementation Plan (2024–2033), and advances the AfDB High 5 priorities—Industrialize Africa, Integrate Africa, and Improve Quality of Life for the People of Africa—through fiduciary modernization and governance reforms. Regionally, DPFIP harmonizes with the COMESA Digitalisation Strategy, the SADC Regional Infrastructure Development Master Plan, and the EAC Financial Sector Development Framework, embedding interoperability and shared standards across member states. At the global normative level, DPFIP operationalizes the principles of Agenda for Social Equity 2074, ensuring that fiscal governance is inclusive, ethical, and resilient.

Chapter 3: Strategic Objectives

Governance Integrity and Fiduciary Modernization

The primary strategic objective of DPFIP is to institutionalize governance integrity through the modernization of fiduciary systems. Public finance and procurement constitute the backbone of state functionality; yet, they remain vulnerable to inefficiencies, opacity, and systemic leakage. DPFIP addresses these vulnerabilities by embedding digital controls, algorithmic transparency, and open contracting standards into national and regional frameworks.

This objective is operationalized through the deployment of e-procurement platforms, contract registers, and spend analytics dashboards, all designed to enforce compliance and accelerate procurement cycles. By integrating AI-driven anomaly detection and vendor performance scoring, DPFIP ensures that fiscal decisions are evidence-based, auditable, and resistant to manipulation. These measures collectively advance the principles of value for money, competitive neutrality, and public accountability, thereby reinforcing institutional legitimacy and donor confidence.

From a normative perspective, governance integrity under DPFIP is not merely a technical aspiration but a constitutional imperative. It aligns with Agenda 2063's Second Ten-Year Implementation Plan (2024–2033), which prioritizes transparent governance and efficient public service delivery, and with Agenda for Social Equity 2074, which codifies fiduciary ethics as a cornerstone of social justice. Regionally, this objective harmonizes with the COMESA Digitalisation Strategy, ensuring interoperability of procurement systems across borders, and supports AfDB's High 5 priority of Improving the Quality of Life for the People of Africa by reducing fiscal waste and redirecting resources toward essential services.

Digital Transparency and Open Standards

The second strategic objective of DPFIP is to institutionalize digital transparency through the adoption of open contracting data standards (OCDS) and interoperable procurement frameworks. Transparency in public finance is not merely a compliance requirement; it is a structural safeguard against corruption, fiscal leakage, and inefficiency. By embedding OCDS-compliant protocols into national procurement systems, DPFIP ensures that every stage of the procurement lifecycle—from tender issuance to contract execution and payment—is digitally recorded, publicly accessible, and verifiable.

This objective is reinforced by the integration of real-time spend analytics, contract registers, and vendor performance dashboards, enabling ministries, oversight bodies, and civil society to monitor procurement activities with unprecedented granularity. The inclusion of algorithmic explainability within AI-driven anomaly detection systems further guarantees that automated decisions remain auditable and free from bias, thereby strengthening institutional accountability.

To illustrate the comparative advantage of OCDS compliance under DPFIP, the following table sets out the baseline OCDS features and DPFIP-specific enhancements:

Table: OCDS Compliance vs. DPFIP Enhancements

Dimension	Baseline OCDS Feature	DPFIP Enhancement
Data Disclosure	Publication of tender, award, and contract data	Real-time dashboards with API-based public access
Lifecycle Coverage	Tender → Award → Contract	Full integration with payment and performance monitoring
Interoperability	JSON schema for structured data	Regional harmonization with COMESA, SADC, and EAC systems
Auditability	Static data for compliance checks	Dynamic anomaly detection with algorithmic transparency
Stakeholder Access	Public portals for data download	Interactive dashboards for ministries, DFIs, and civil society
Performance Metrics	Limited to contract milestones	Vendor scoring, value-for-money indices, and predictive analytics

By elevating OCDS compliance into a dynamic transparency ecosystem, DPFIP transforms procurement from a closed administrative process into a publicly accountable governance function. This approach aligns with Agenda 2063's governance efficiency pillar, AfDB's fiduciary safeguards, and Agenda 2074's ethical governance principles, while reinforcing regional integration objectives through shared standards and cross-border interoperability.

AI-Driven Integrity and Predictive Oversight

The third strategic objective of DPFIP is to embed artificial intelligence (AI) as a structural instrument for predictive oversight and integrity assurance in public finance and procurement systems. Traditional

audit mechanisms, while necessary, are inherently reactive and often detect irregularities only after fiscal damage has occurred. DPFIP introduces a paradigm shift by institutionalizing proactive anomaly detection, predictive risk scoring, and algorithmic governance across the entire fiduciary lifecycle.

Under this objective, AI systems shall be deployed to monitor procurement transactions in real time, flagging anomalies such as bid rigging, collusive pricing, and irregular payment patterns. Machine learning models will analyze historical procurement data to identify risk clusters and forecast potential compliance breaches before they materialize. These predictive capabilities enable ministries and oversight bodies to intervene early, thereby reducing fiscal leakage and safeguarding public resources.

To ensure ethical deployment, all AI-driven integrity tools under DPFIP shall comply with algorithmic transparency standards, including mandatory publication of explainability reports and bias audits. Human-in-the-loop protocols will be enforced for all critical decisions, preserving accountability and preventing systemic over-reliance on automated judgments. This approach aligns with AfDB's fiduciary safeguard policies, COMESA's interoperability standards, and the normative principles of Agenda 2074, which codify algorithmic fairness and inclusive governance as non-negotiable obligations.

The operationalization of this objective will be supported by vendor performance dashboards, spend analytics platforms, and contract lifecycle monitoring systems, all integrated within a unified DESA compliance architecture. These instruments collectively transform procurement oversight from a static compliance exercise into a dynamic governance function, reinforcing institutional resilience and public trust.

Regional Harmonization and Social Equity

The fourth strategic objective of DPFIP is to establish a harmonized regional procurement and finance ecosystem that promotes interoperability, shared infrastructure, and inclusive participation. Public finance and procurement systems, when fragmented across jurisdictions, create inefficiencies, increase transaction costs, and undermine regional integration efforts. DPFIP addresses this challenge by embedding common standards, shared platforms, and cross-border compliance protocols aligned with COMESA, SADC, and EAC frameworks.

This harmonization objective ensures that procurement data, contract registers, and vendor performance metrics are interoperable across member states, enabling regional pooled procurement, joint audits, and collective bargaining for cost efficiency. By leveraging shared infrastructure—including cloud-based procurement portals and regional analytics hubs—DPFIP reduces duplication of resources and accelerates the adoption of best practices across borders.

Equally critical is the programme's commitment to social equity in procurement. DPFIP mandates inclusive vendor participation by enforcing gender equity clauses, SME access provisions, and disability-friendly bidding processes. These measures operationalize the normative principles of Agenda for Social Equity 2074, ensuring that procurement modernization does not perpetuate structural exclusion but rather serves as a catalyst for equitable economic participation.

From an economic standpoint, regional harmonization under DPFIP enhances national competitiveness, reduces fiscal inefficiencies, and strengthens donor confidence by demonstrating systemic integrity across multiple jurisdictions. This objective aligns with Agenda 2063's integration pillar, AfDB's High 5 priority of "Integrate Africa", and COMESA's digitalisation strategy, positioning partner states as leaders in transparent, inclusive, and digitally enabled governance.

Chapter 4: Institutional Architecture and Governance

Purpose and Placement within DESA.
The DESA Public Finance & Procurement Integrity Programme (DPFIP) is instituted as a sovereign governance instrument under the DESA Institutional Governance Manual. It operates through a nested architecture that secures central oversight, national execution, and independent assurance, ensuring legality, auditability, and continuity across mandate periods.

Programme Office Structure.
The DPFIP Programme Office shall be constituted at national level, reporting to the DESA Central Unit and the national DESA Steering Committee. Its internal arrangement is functional rather than departmental, limiting fragmentation and facilitating end-to-end accountability.

Core Directorates and Units.
The Programme Office comprises three Directorates and associated Units, established by Operating Circulars and referenced in MoUs with host ministries:

1. **Directorate of Fiduciary Systems & Standards.**
   Mandated to codify and enforce procurement and public finance standards, including Open Contracting Data Standards (OCDS), data governance, and interoperability with regional frameworks.
   Units: Standards & Policy; Data Governance & Privacy; Interoperability & OCDS Compliance.

2. **Directorate of Digital Operations & Analytics.**
   Mandated to deploy and operate e-procurement platforms, contract registers, spend analytics, vendor performance dashboards, and AI anomaly detection services.

   Units: Platform Operations; Analytics & Reporting; AI Integrity & Explainability.

3. **Directorate of Capacity & Institutional Enablement.**
   Mandated to deliver capacity building and certification for procurement officers, auditors, IT staff, and oversight bodies; maintains continuous learning pathways with academia and professional institutes.

   Units: Training & Certification; Change Management & Adoption; Stakeholder Engagement & Inclusion.

Steering Committees and Reporting Lines.
DPFIP governance relies on two committees with distinct mandates and escalation thresholds:

- **National DESA Steering Committee (N-DSC).**
  Chaired by the Prime Ministry or the Ministry of Finance/Planning (as designated). Provides policy direction, approves Operating Circulars, budget envelopes, and annual work plans. Receives quarterly compliance reports and adjudicates cross-ministerial issues.

- **Independent Assurance and Audit Committee (IAAC).**
  Constituted with representation from the Supreme Audit Institution, anti-corruption agency, civil society, academia, and development partners. Validates risk registers, audit plans, algorithmic transparency reports, and grievance redress outcomes. Issues biannual public assurance notes.

Compliance Mechanisms and Lines of Accountability.
Compliance is enforced through binding instruments: Operating Circulars, Procurement Integrity Codes, Data Protection Protocols, and Algorithmic Governance Guidelines. Non-compliance triggers corrective action plans with time-bound remediation, and—if persistent—escalation to the DESA Central Unit for sanction (including suspension of platform privileges).

Assurance, Grievance, and Redress.
A unified Grievance Redress Mechanism is maintained by the IAAC Secretariat, with case intake from vendors, citizens, and whistle-blowers via protected channels. All cases are logged, triaged, investigated, and disclosed through quarterly summaries, subject to privacy law. Where algorithmic decisions are implicated, explainability reports and human review records are annexed to case files.

Public Disclosure and Ethics.
The Programme Office publishes a public procurement dashboard and annual Integrity Report, containing value-for-money indices, cycle-time metrics, anomaly detection statistics, and audit findings. An Ethics Code binds all DPFIP staff and implementers, with conflict-of-interest declarations and rotation policies for sensitive roles.

Table 1: Governance Bodies, Mandates, and Reporting Cadence

Body	Mandate	Key Instruments	Reporting Cadence
DESA Central Unit	Supreme oversight; accreditation; cross-programme harmonization	Operating Circulars; Accreditation Standards	Quarterly consolidation; annual review
National DESA Steering Committee	National policy direction; budgets; inter-ministerial decisions	National Work Plan; Budget Envelope Resolution	Quarterly compliance sessions
Programme Office (DPFIP)	Day-to-day execution; standards; operations; capacity	Integrity Code; Platform SOPs; Data Protocols	Monthly operational reports; quarterly KPIs
Independent Assurance & Audit	External assurance; audits; grievance and ethics adjudication	Audit Plans; Assurance Notes; GRM Protocol	Biannual audits; quarterly grievance logs
Supreme Audit Institution (SAI)	Statutory audit; special investigations	Statutory Reports; Special Audit Findings	Annual statutory; ad-hoc special audits

Chapter 5: Implementation Framework

Three-Tier Model.
Implementation is sequenced across three coherent tiers—Infrastructure, Application, and Capacity—to minimize complexity and ensure durable institutionalization. Each tier is governed by simple entry/exit criteria and limited deliverables to avoid document bloat and Word editing friction.

1. **Infrastructure.**
   Establish secure, interoperable foundations: e-procurement platform provisioning, contract register schema (OCDS-aligned), secure data lake for spend analytics, role-based access controls, and audit trails. Hosting follows sovereign directives (government cloud or approved colocation) with cross-border data arrangements governed by regional standards.

2. **Application.**
   Operationalize procurement lifecycles: tendering, evaluation, award, contract management, and payment linkage. Deploy dashboards for cycle-time and value-for-money indices, vendor performance scoring, and AI anomaly detection with explainability. Integrate grievance and redress hooks at critical steps.

3. **Capacity.**
   Certify procurement officers, auditors, platform operators, and oversight bodies. Run short adoption sprints for ministries and state-owned entities. Establish train-the-trainer pipelines with accredited institutes and universities. Publish concise user guides and ethics notes; avoid excessive sub-modules to preserve editability.

Table 2: Three-Tier Model — Objectives, Deliverables, and Exit Criteria

Tier	Objective	Mandatory Deliverables	Exit Criteria
Infrastructure	Secure, interoperable foundations	Platform provisioned; OCDS schema adopted; data lake; RBAC; audit trail configured	Security test passed; data quality baseline validated
Application	End-to-end procurement operations with analytics & AI	Live tender→award→contract flows; dashboards; vendor scoring; anomaly detection	≥90% of target entities onboarded; dashboards ≥99.5% uptime
Capacity	Certified workforce and adoption	Certification cohorts; trainer registry; GRM integration; concise SOPs	Cohort pass-rate ≥80%; user adoption ≥75% in target units

Sequencing Phases.
The programme is executed in three phases—**Initiation**, **Scale-Up**, and **Consolidation**—with limited, high-impact deliverables and simple numbering to avoid Word spacing artefacts.

Phase A — Initiation (Months 0–6)
Objectives. Establish legal sufficiency, platform readiness, and quick-win transparency.

Core Activities.
Operating Circulars enacted; MoUs signed with finance/procurement authorities; OCDS baseline mapped; platform provisioned; pilot entities selected; initial dashboards published (tenders, awards, contracts); GRM channel opened; first anomaly-detection sandbox with explainability.

Deliverables and Exit Criteria.
- Policy pack approved (Integrity Code; Data Protection; Algorithmic Governance).

- Platform go-live with ≥3 pilot entities; public dashboard visible.

- First assurance note issued; corrective actions logged.

Phase B — Scale-Up (Months 6–18)
Objectives. Extend coverage, embed analytics, and standardize vendor performance scoring.

Core Activities.
Onboarding of ministries and SOEs; payment system linkage for contract execution monitoring; vendor performance dashboard activated; adoption sprints; train-the-trainer cohorts; regional interoperability pilot with customs/treasury peers.

Deliverables and Exit Criteria.
- ≥60% of targeted entities operating end-to-end flows.

- Value-for-money index baseline; cycle-time reduction ≥20% vs pre-DPFIP.

- Biannual independent audit report published; grievance SLAs ≥95% met.

Phase C — Consolidation (Months 18–36)
Objectives. Institutionalize standards, complete national coverage, and harden assurance.

Core Activities.
National standard adoption; full vendor registry; pooled procurement options; algorithmic transparency reports embedded in routine audits; cost-recovery and sustainability plan; annual Integrity Report.

Deliverables and Exit Criteria.

- ≥90% national coverage of target entities; dashboards resilient (≥99.5% uptime).

- Leakage reduction target evidenced by audit (benchmark set at Initiation).

- IAAC issues clean assurance with remediation closed; mandate renewed.

Table 3: Minimalistic Workstream Matrix (to preserve editability)

Workstream	Lead	Key Output	Interface
Standards & Policy	Directorate of Fiduciary Systems	Integrity Code; OCDS Operating Note	N-DSC; IAAC
Platform Operations	Directorate of Digital Operations	E-procurement SOP; uptime & security logs	Ministries; SOEs
Analytics & AI	Digital Operations (AI Unit)	Spend analytics; anomaly explainability	IAAC; Supreme Audit Institution
Capacity & Adoption	Directorate of Capacity	Certification cohorts; trainer registry	Academia; civil service
Assurance & GRM	IAAC Secretariat	Assurance notes; grievance case closures	Public dashboard; donors

Integration with DTIF and PPPs.

Where results-based disbursements via the DESA Trust and Investment Facility (DTIF) are applied, DPFIP dashboards and audit trails serve as verification tools for tranche releases. PPP frameworks may be used for platform hosting and shared services; tariff safeguards and affordability clauses are inserted in contracts to protect public budgets and SME vendor access.

Legal and Ethical Safeguards in Implementation.

All deployments comply with national data protection law; regional cross-border data exchange adheres to harmonized standards. Algorithmic decisions affecting awards or exclusions require human review and documented explainability. Inclusion safeguards guarantee accessibility for SMEs, women-led firms, and disability-owned enterprises, with measurable participation targets.

Chapter 6: Fiduciary Architecture and Financing Instruments

Purpose and Financing Principles.

The fiduciary architecture of the DESA Public Finance & Procurement Integrity Programme (DPFIP) is designed to secure adequacy of resources, predictability of funding flows, and auditability of expenditures across the full contracting lifecycle. It anchors procurement modernization in sovereign legal instruments, embeds results-based verification for disbursements, and aligns with continental and regional development frameworks to maintain policy coherence and bankability. In normative terms, open contracting data and publication at each stage of the procurement process constitute the baseline for transparency and value-for-money analysis, as codified in the Open Contracting Data Standard (OCDS), which defines a common data model for disclosure and auditability from tender through award and implementation. The financing architecture complements internationally recognized guidance that end-to-end e-procurement reduces corruption exposure, strengthens oversight, and integrates performance indicators into public financial management reforms.

Alignment and Strategic Fit.

DPFIP financing instruments shall be structured to reinforce Agenda 2063's Second Ten-Year Implementation Plan (2024–2033) and its emphasis on accelerated implementation and integrated infrastructure, with programme results cross-walked to the STYIP reporting framework. The architecture further supports the African Development Bank's High 5 priorities—Light up and Power Africa, Feed Africa, Industrialize Africa, Integrate Africa, and Improve the Quality of Life for the People of Africa—through fiduciary modernization and regional market integration that reduce leakage and improve procurement performance.

Sources and Instruments.

Financing is diversified to mitigate dependency risk and to match instrument type to verification modality. The DESA Development Fund constitutes the primary source; AfDB participates in concessional windows and technical assistance; development partners provide targeted grants; and PPPs and cost-recovery mechanisms secure sustainability. Instruments are bound to transparent disclosure and independent assurance.

Table 6.1: Financing Sources and Instruments

Source	Instrument Form	Primary Use	Verification Linkage
DESA Development Fund	Budget allocations; revolving envelopes	Core platform, data lake, dashboards	OCDS publication; audit trails; quarterly KPIs [standard.o...acting.org]
AfDB	Concessional loans; grants; TA	Scale-up, interoperability, capacity	STYIP cross-walk; High 5 alignment; biannual assurance [au.int], [afdb.org]
DFIs and Bilateral Donors	Grants; trust-funded pilots	Inclusion safeguards; GRM; audits	OECD integrity benchmarks; public disclosure notes [oecd.org]
PPPs (hosting/shared services)	Service contracts; availability payments	Cloud/hosting; shared analytics hubs	Contract registers; performance dashboards; SLA audits [worldbank.org]
Cost-Recovery (advanced tiers)	Modest certification and service fees	Sustainability and maintenances	Annual Integrity Report; independent audit opinion

DTIF Integration and Results-Based Disbursement.

Where the DESA Trust and Investment Facility (DTIF) is used for results-based tranches, DPFIP's dashboards and audit trails function as verification instruments for disbursement eligibility. The underlying logic follows the procurement lifecycle: publication of tenders and awards, contract execution with payment linkages, vendor performance scoring, and anomaly-detection explainability, in line with open contracting methodologies and e-procurement reference practices.

Table 6.2: Disbursement and Verification Pipeline (DTIF-Linked)

Stage	Minimum Evidence	Verifier	Disbursement Trigger
Tender & Award	OCDS-compliant publication; competition metrics	Programme Office; IAAC	Tranche A after baseline compliance
Contract Management	Contract register updates; milestone acceptance; payment linkage	Supreme Audit Institution; IAAC	Tranche B upon cycle-time and VfM thresholds
Performance & Risk	Vendor scoring; anomaly explainability; corrective actions	Independent auditor; DESA Central Unit	Tranche C upon audit clearance and remediation logs

Stage	Minimum Evidence	Verifier	Disbursement Trigger
Public Disclosure	Integrity Report; grievance statistics; inclusion KPIs	IAAC; civil society observers	Renewal tranche upon disclosure timeliness and quality

PPP Frameworks, Tariff Safeguards, and Affordability.
PPP models may be used for platform hosting, regional hubs, and shared analytics. To protect public budgets and SME access, contract clauses shall stipulate affordability caps, transparent tariff adjustment formulas, and service-level credits for non-performance. These measures are consistent with international guidance that situates e-procurement within broader PFM and market governance reforms, with early market engagement and aggregated procurement used to secure efficiencies.

Cost-Control and Value-for-Money.
Cost-control is obtained through pooled procurement, open-source adoption where feasible, and regional shared services. Governments leveraging open contracting data can analyze price trends and supplier performance to document value-for-money outcomes and detect fraud indicators. In parallel, OECD integrity frameworks are adopted to mitigate risks across pre-tendering, tendering, and post-award phases.

Sustainable Procurement and ESG Coherence.
Sustainable procurement guidance (ISO 20400) shall inform supplier evaluation, life-cycle costing, and social inclusion clauses without imposing certification obligations; it is a guidance framework used to integrate sustainability into procurement policies and processes.

Chapter 7: Compliance and Ethics

Legal Bases and Normative Instruments.
DPFIP compliance obligations are codified under national public procurement statutes, DESA Operating Circulars, and regional standards for data protection and digital governance. The African Union Convention on Cyber Security and Personal Data Protection (Malabo Convention) provides a continental legal framework for electronic transactions, data protection authorities, and cybersecurity cooperation, now in force following the requisite ratifications. Algorithmic transparency obligations are aligned to the European Union Artificial Intelligence Act, including marking of AI-generated content, disclosure of interactive AI, and human oversight standards for high-risk deployments; Article 50 sets specific transparency duties for providers and deployers of certain AI systems.

Ethical Governance and Integrity Controls.
The programme institutionalizes an Anti-Bribery Management System referencing ISO 37001:2025, establishing leadership accountabilities, due diligence on business associates, financial and non-financial controls, and investigation protocols for suspected bribery. Integrity safeguards further incorporate OECD principles for transparency, competition, stakeholder participation, and objective decision-making across the procurement cycle.

Data Protection and Access Controls.
Sensitive data are processed under lawful bases with encryption at rest and in transit, role-based access controls, and audit trails. Cross-border exchanges—where applicable—are governed by regional

harmonization instruments and require documented impact assessments consistent with continental legal frameworks.

Algorithmic Transparency and Human-in-the-Loop.
Where AI is used for anomaly detection, vendor scoring, or decision support, DPFIP enforces explainability reports, maintains automatically generated logs, and ensures human review for any decision with legal or material effect on awards or exclusions. Transparency obligations for interactive systems and synthetic content labelling shall follow the EU AI Act's Article 50 guidance to prevent deception and maintain trust.

Grievance Redress and Audit Obligations.
A unified Grievance Redress Mechanism (GRM) receives protected submissions from vendors, citizens, and whistle-blowers. Cases involving algorithmic determinations shall annex explainability artefacts and human review records. Independent audits—statutory and programme-specific—are carried out periodically, with public assurance notes summarizing findings and corrective actions, consistent with OECD public integrity recommendations and good practice compendia.

Inclusion Safeguards.
Procurement accessibility is ensured for SMEs, women-led firms, and disability-owned enterprises through simplified participation requirements and equitable evaluation criteria. Sustainable procurement guidance supports life-cycle costing, human rights due diligence, and multi-stakeholder engagement without imposing certification; it is used to align procurement strategies with organizational sustainability and social equity objectives. [iso.org]

Table 7.1: Compliance Map — Instruments and Obligations

Domain	Instrument	Obligation	Assurance Mechanism
Data Protection	AU Malabo Convention	Legal basis, DPA oversight, cybersecurity cooperation	Legal conformity review; periodic audits [au.int]
Algorithmic Transparency	EU AI Act (Article 50)	Labelling of synthetic content; disclosure of AI interaction; human oversight for high-risk use	Explainability reports; log retention; human review [aiactinfo.eu]
Anti-Bribery	ISO 37001:2025	ABMS policies; due diligence; financial/non-financial controls; investigation protocols	Internal audit; external certification where chosen [iso.org]
Procurement Integrity	OECD Principles	Transparency, competition, stakeholder participation; objective criteria	Assurance notes; GRM statistics; VfM indices [oecd.org]
Open Contracting	OCDS	End-to-end publication; machine-readable data; codelists; identifiers	Data quality checks; public dashboards; API access [standard.o...acting.org]

Domain	Instrument	Obligation	Assurance Mechanism
Sustainable Procurement	ISO 20400	Life-cycle costing; ESG coherence; human rights; multi-stakeholder engagement	Policy reviews; supplier evaluation narratives [iso.org]

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- **AU Malabo Convention**: Treaty text and status: au.int

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Chapter 8: Regional Replication and Integration

The DESA Public Finance & Procurement Integrity Programme (DPFIP) is conceived as a regional public good. Its legal and technical design enables lawful replication across Regional Economic Communities (RECs) through harmonised norms, interoperable data standards, and shared operational services. In Eastern and Southern Africa, the COMESA Inclusive Digitalisation of Eastern and Southern Africa (IDEA) programme establishes a regional coordination platform, knowledge facility, and policy harmonisation track for affordable broadband, trusted data platforms, and digitally enabled services—an institutional setting into which DPFIP's open contracting, analytics, and assurance components can be embedded with minimal adaptation. COMESA's first-phase grant and multi-country financing, coupled with its regional PCU, provide a lawful vehicle for pooling investments in e-procurement and procurement analytics, with a view to cross-border interoperability and shared service models.

Within SADC, procurement policy and capacity development are the subject of explicit Secretariat instruments and World Bank–supported frameworks. Recent guidance and policies (2021–2025) codify procurement principles, disclosure, and grants management, while the public procurement umbrella M&E and capacity development project creates a regional results and oversight fabric into which DPFIP dashboards, anomaly-detection explainability, and integrity indicators can be integrated as standard

artefacts. Complementary SADC frameworks on PPP policy and regional technical harmonisation (SQAM/TBT structures) facilitate shared hosting, auditability, and cross-recognition of quality and compliance controls necessary for regional procurement markets.

For EAC, the Common Market Protocol (Article 35) requires non-discrimination in public procurement, imposes transparency and equal treatment obligations, and frames procurement as an integration instrument alongside the free movement of services and capital. DPFIP's open standards and public disclosure align with these obligations and provide the technical and fiduciary scaffolding for pooled procurement (for example, medicines), regional vendor eligibility, and mutual access.

The practical vector for replication is data and disclosure. The Open Contracting Data Standard (OCDS) defines a common data model and codelists to disclose tenders, awards, contracts, and implementation milestones with machine-readable precision, lowering integration costs and enabling cross-REC analytics. OCDS is already the baseline for multi-country use, including in open-source platforms such as Ukraine's Prozorro model (see Chapter 9), and is explicitly recommended in World Bank e-procurement guidance.

To avoid fragmentation and reduce sovereign cost, DPFIP proposes a shared services approach for hosting, monitoring, and knowledge. COMESA's IDEA platform and SADC's capacity frameworks offer lawful anchoring points for a regional procurement integrity hub providing API-based publication registries, red-flag analytics, and a knowledge repository of playbooks and conformance tests, all operated under REC auspices and national agreements.

Table 8.1: REC Harmonisation Levers and DPFIP Artefacts

REC / Instrument	Harmonisation Lever	DPFIP Replication Artefacts
COMESA (IDEA)	Regional PCU; policy and regulatory harmonisation; regional knowledge & capacity components	OCDS publication registry; cross-border API catalogue; shared anomaly-detection service; regional training and accreditation
SADC (Policies & M&E)	Secretariat procurement policies/guidelines; regional M&E and capacity programme	Standard indicators and dashboards; common assurance notes; audit sampling protocols; GRM templates
SADC (PPP Framework; SQAM/TBT)	PPP policy alignment; technical standards and conformity structures	Model PPP clauses for e-procurement hosting; service-level and tariff safeguards; conformance and certification pathways
EAC (Common Market Protocol, Art. 35)	Non-discrimination and transparency in procurement	Open vendor access rules; regional competition scorecards; pooled procurement templates (e.g., health)

The governance logic remains sovereign: national procurement laws control tendering and award; the regional layer supplies shared tools, data, and mutual recognition. This approach is consistent with OECD integrity principles and contemporary digital procurement practice, which favour end-to-end integration, open data, and risk-based oversight rather than duplicative, paper-based control.

Chapter 9: Programme Benefits and Economic Rationale

DPFIP's economic case rests on three interlocking effects: reduction of procurement prices through competition and transparency; administrative efficiency and cycle-time compression; and wider market activation for SMEs and cross-border suppliers. The general magnitude of procurement in national economies, typically on the order of 12–20 percent of GDP, implies that even modest efficiency gains deliver material fiscal space.

Price and value-for-money effects. A recent cost-benefit analysis finds that implementing a robust e-government procurement (e-GP) system in low- and lower-middle income countries yields an average 6.75 percent reduction in procurement prices, with benefit-cost ratios of 8–58 and 142–473 respectively, driven by market size, penetration, and the duration of implementation. A World Bank systematic review similarly reports that well-implemented tools commonly deliver 5–10 percent savings, while centralised procurement and framework agreements can exceed **50 percent** on specific baskets when competition is properly induced and volumes are aggregated. Evidence syntheses from the open contracting literature corroborate cost savings, competition uplift, and service-delivery improvements when data are published across the full lifecycle and used by oversight actors.

Efficiency and cycle-time effects. Digitalisation reduces transaction costs and cycle times by automating publication, bid submission, evaluation workflows, and post-award management; empirical work on Ukraine's Prozorro indicates increases in bidder numbers, cost savings, and **reduced** contracting times following the reform. OECD's contemporary guidance emphasises end-to-end process integration and data-driven management as the route to a more transparent, agile procurement function—precisely the design embedded in DPFIP.

Competition and market activation, including SMEs. Open publication and non-discriminatory access increase bidder participation and reduce barriers for SMEs and non-incumbents; OGP's comparative assessment highlights material gains in inclusion and competition when portals and open data are used systematically. The EAC Common Market non-discrimination obligations further support supplier mobility and regional competition, which DPFIP operationalises through standardised disclosure and regional vendor registries.

Case evidence for the DPFIP toolchain. Ukraine's Prozorro—architected on open data and radical transparency—documents multi-year fiscal benefits and a step-change in market participation; recent assessments report multibillion-dollar cumulative savings and a ten-fold increase in participating firms, while independent analyses show more bidders and faster processing. In Chile, redesigning framework agreements to increase competition and standardise catalogues delivered ~8 percent price reductions in a controlled pilot that later scaled system-wide.

Macroeconomic and social equity linkages. The fiscal room created by procurement savings can be redirected to priority services, while non-price criteria and sustainable procurement guidance (ISO 20400) allow states to incorporate life-cycle costing, ESG safeguards, and inclusion targets without compromising legality or competition. At the regional level, digital infrastructure programmes such as COMESA-IDEA aim to expand internet access and digital services to hundreds of millions, amplifying the uptake and impact of e-procurement tools that rely on connectivity and shared data services.

The programme therefore provides a bankable, measurable path to improved competitiveness: lower input prices and lower transaction costs improve public service productivity; open, harmonised markets favour entry and innovation; and transparent audit trails and algorithmic explainability reinforce public trust and donor confidence. The convergence with AU Agenda 2063 and AfDB High 5

priorities ensures that these benefits are not incidental but strategically aligned with continental targets and bank financing criteria.

Table 9.1: Benefits, Indicators, and Evidence Anchors

Benefit Domain	Indicative Indicator (DPFIP MRV)	Evidence Anchor
Price savings / VfM	Average awarded price vs. benchmark (by CPV/UNSPSC); % savings	e-GP CBA avg. **6.75%** reduction; WB review **5–10%**, **>50%** in centralised FAs; Chile FA pilot **~8%** [cambridge.org], [documents1...ldbank.org], [ideas.repec.org]
Competition	Avg. bidders per tender; % single-bid tenders	Ukraine: more bidders post-reform; OCP syntheses on competition gains [cgdev.org], [open-contracting.org]
Efficiency / timeliness	Median days tender→award; award→first delivery; % procedures completed on time	Ukraine: reduced contracting times; OECD guidance on end-to-end digital flows [cgdev.org], [cambridge.org]
Integrity / risk	Red-flag alerts resolved; anomaly explainability dossiers; audit findings closure rate	OCDS-based red-flags; OECD integrity principles; programme audits [linkedin.com], [eac.int]
Inclusion / SME access	Share of awards to SMEs; women-/disability-owned participation; de-biasing outcomes	OGP procurement analysis; EAC non-discrimination provisions [opengovpar...ership.org], [eacj.org]
Sustainability	Life-cycle costing adoption; sustainable procurement clauses in % tenders	ISO 20400 guidance for sustainable procurement [open-contracting.org]

References

- **COMESA – IDEA Programme**: Programme documents and PCU/coordination role (comesa.int); WB ESRS Concept & components (documents.worldbank.org); Launch and targets (180m access; 100m services) (comesa.int news).

- **SADC – Procurement and Capacity**: Secretariat procurement policies/guidelines (sadc.int); WB Public Procurement Umbrella M&E & Capacity Project (documents.worldbank.org); SADC PPP Regional Framework (sadc-dfrc.org); SQAM/TBT harmonisation structures (sustmob.org).

- **EAC – Common Market / Procurement**: Common Market Protocol (Article 35) (eacj.org); EAC Common Market overview (eac.int); EAC procurement procedures (eac.int); Competition Authority note on public procurement (eacompetition.org).

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- **OECD**: Digital transformation of public procurement (2025 report) (oecd.org); Principles for Integrity in Public Procurement (oecd.org); Government at a Glance 2025—size of procurement (oecd.org).

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- **Chile**: Framework agreement redesign—peer-reviewed and working versions ([ideas.repec.org / INFORMS Interfaces](ideas.repec.org); Stanford/Universidad de Chile working paper).

- **Sustainable Procurement**: ISO 20400 guidance ([iso.org](iso.org)).

Chapter 10: Measurement, Reporting, and Verification (MRV)

Purpose and Normative Basis.
The MRV framework for DPFIP is a binding instrument designed to ensure transparency, accountability, and continuous performance improvement. It operates under the unified DESA Monitoring, Evaluation, and Learning (MEL) system and cross-walks to Agenda 2063 indicators, AfDB High 5 priorities, and REC digitalisation strategies. Its principles—objectivity, independence, and data integrity—are codified in Operating Circulars and enforced through independent audits and public disclosure.

KPI Families and Dimensions.
Indicators are structured across six dimensions: fiduciary integrity, efficiency, value for money, inclusion, sustainability, and strategic alignment. Each KPI is linked to a data source, verification method, and reporting cadence.

Table 10.1: KPI Families and Examples

Dimension	Indicative KPI	Data Source	Verification
Fiduciary Integrity	% tenders published OCDS-compliant; anomaly alerts resolved	Platform logs; audit trails	Independent audit; IAAC assurance note
Efficiency	Median tender→award cycle time; % procedures on time	Dashboard analytics	Quarterly MEL report; external review
Value for Money	Avg. awarded price vs. benchmark; VfM index	Contract register; spend analytics	Biannual audit; public disclosure
Inclusion	SME participation rate; women/disability-owned awards	Vendor registry; GRM logs	IAAC review; civil society observation
Sustainability	% tenders with life-cycle costing; ESG clauses	Tender documents; policy registry	Compliance audit; ISO 20400 alignment

Dimension	Indicative KPI	Data Source	Verification
Strategic Alignment	Contribution to Agenda 2063 indicators; AfDB High 5 link	MEL dashboard; REC reports	Annual performance report; donor review

Reporting Cadence and Public Disclosure.

- **Monthly Operational Reports**: Programme Office to N-DSC.

- **Quarterly Compliance Reports**: National Steering Committee to DESA Central Unit.

- **Biannual Assurance Notes**: IAAC to public dashboard.

- **Annual Integrity Report**: Consolidated disclosure aligned with Agenda 2063 and AfDB frameworks.

Verification and Audit Protocols.

Audits are conducted at three levels: formative (Phase A), mid-term (Phase B), and summative (Phase C). Each audit includes KPI validation, anomaly explainability checks, and compliance with ethical and data governance standards. Public dashboards provide API-based access to OCDS data, red-flag alerts, and grievance statistics.

Chapter 11: Stakeholder Engagement and Capacity Building

Purpose and Engagement Logic.

DPFIP's success depends on multi-stakeholder participation across ministries, academia, private sector, civil society, and development partners. Engagement is structured to ensure lawful representation, technical validation, and inclusive capacity development.

Stakeholder Categories and Roles.

- **Government Ministries**: Finance, Planning, ICT, and sector ministries (health, education, infrastructure) for policy adoption and operational integration.

- **Supreme Audit Institutions and Anti-Corruption Agencies**: Independent assurance and risk oversight.

- **Academia and Professional Institutes**: Curriculum development, certification, and research partnerships.

- **Private Sector and SMEs**: Vendor participation, technology partnerships, and PPP hosting models.

- **Civil Society and Media**: Transparency advocacy, grievance monitoring, and public accountability.

- **Development Partners and DFIs**: Financing, technical assistance, and safeguard validation.

Table 11.1: Engagement Tracks and Deliverables

Track	Stakeholder Group	Deliverable
Policy & Governance	Ministries; N-DSC	Operating Circulars; Integrity Code; budget approvals
Assurance & Ethics	IAAC; Supreme Audit Institution	Audit plans; assurance notes; grievance protocols
Capacity & Certification	Academia; professional bodies	Training modules; certification tiers; trainer registry
Technology & PPP	Private sector; DFIs	Platform hosting agreements; SLA frameworks
Transparency & Advocacy	Civil society; media	Public dashboards; Integrity Report; GRM summaries

Capacity Building Framework.

Training is delivered through modular tracks:

- **Foundational**: Procurement law, OCDS, ethics, and data governance.

- **Applied**: Platform operation, spend analytics, anomaly detection.

- **Advanced**: Algorithmic transparency, risk management, and regional interoperability.

Certification tiers mirror DESA standards and are co-endorsed by national authorities and regional bodies. Train-the-trainer pipelines ensure sustainability, while academic partnerships embed modules into university curricula and civil-service training standards.

Inclusion and Accessibility.

Capacity tracks incorporate universal design principles and assistive technologies to ensure participation by individuals with disabilities. Vendor training includes simplified onboarding for SMEs and women-led enterprises, reinforcing Agenda 2074's equity mandate.

Chapter 12: Participation and Partnership Framework

Purpose and Instruments.

The Participation and Partnership Framework establishes the lawful arrangements through which ministries, regional bodies, development financiers, private vendors, academic institutions, civil society, and media interact with the DESA Public Finance & Procurement Integrity Programme (DPFIP). It is anchored in national public procurement statutes, DESA Operating Circulars, and REC frameworks for digitalisation and market integration. In Eastern and Southern Africa, the COMESA-IDEA programme provides a regional coordination and knowledge platform for harmonising digital policy, convening shared services (e.g., cloud/data hosting, trusted transactions), and mobilising investments—an institutional fabric into which DPFIP's e-procurement, open contracting data publication, analytics, and assurance can lawfully plug. Within **SADC**, Secretariat procurement policies and guidelines (2020–2025) and the World Bank–supported public procurement umbrella M&E and capacity programme

offer a results framework and oversight channel for DPFIP conformance artefacts (dashboards, assurance notes, grievance statistics). The EAC Common Market Protocol (Article 35) imposes non-discrimination and transparency in public procurement, making DPFIP's lifecycle publication and open data standards a natural compliance vehicle for regional supplier access and pooled procurement.

Partner Entry Conditions and Instruments.
Participation proceeds through binding or quasi-binding instruments: Memoranda of Understanding (MoUs) with ministries and SOEs; Service Level Agreements (SLAs) for shared hosting and analytics; Protocols of Audit Cooperation with Supreme Audit Institutions; Ethical Codes and Conflict-of-Interest declarations for all implementers; and data-processing agreements consistent with continental data-protection conventions. REC-level programmes (e.g., COMESA-IDEA) are used to legally house shared services and regional policy harmonisation, while national Operating Circulars define disclosure obligations, algorithmic transparency, and grievance redress.

Roles and Accountability.
The Programme Office maintains day-to-day operations and reporting; the National DESA Steering Committee adjudicates policy and budgets; and an Independent Assurance & Audit Committee (IAAC) validates risk registers, algorithmic explainability dossiers, and grievance outcomes for public reporting. Regional bodies coordinate harmonisation and knowledge transfer, while DFIs provide financing and safeguard validation against AfDB's governance objectives and Agenda 2063's accelerated implementation priorities.

Table 12.1: Participation Tracks and Binding Instruments

Track	Principal Counterpart	Binding / Quasi-Binding Instrument	Assurance / Verification
Policy & Governance	Ministries; National Steering Committee	Operating Circulars; Integrity Code; Budget Resolution	Quarterly compliance reports; IAAC notes
Regional Integration	COMESA; SADC; EAC	REC programme MoUs; shared-services SLAs; policy harmonisation notes	REC M&E frameworks; public dashboards [comesa.int], [help.netflix.com]
Procurement Operations	Programme Office; SOEs; vendors	Platform SOPs; contract registers; OCDS publication APIs	Independent audit; KPI validation
Capacity & Inclusion	Academia; professional institutes; SMEs	Training & certification MoUs; simplified vendor onboarding	Certification records; inclusion KPIs
Transparency & Redress	Civil society; media; IAAC	Grievance Protocol; public Integrity Report	Case closure logs; assurance statements

Chapter 13: Capacity Chapter — Data Transfer Volumes and Fiber Justification (Juba/South Sudan; 1,000,000 Users)

Mandate of the Capacity Chapter.

This chapter quantifies expected data transfer volumes and peak throughput for 1,000,000 users in Juba/South Sudan under three adoption scenarios, and derives busy-hour capacity for fiber justification. It triangulates a top-down benchmark (per-subscription traffic levels from ITU) with bottom-up streaming concurrency and bitrate requirements (YouTube/Netflix), and then converts daily traffic into busy-hour dimensioning values in Gbps. The modelling aligns with widely used traffic-engineering concepts—busy hour, offered/carrying traffic, and grade-of-service—for capacity planning.

Context and Reference Benchmarks.

ITU's 2024 "Facts & Figures" report estimates average monthly traffic per fixed-broadband subscription of ~200–250 GB globally, with Africa's average closer to ~130 GB per fixed line; mobile broadband averages in Africa remain materially lower (3.1 GB per subscription per month). These disparities underscore why "heavy" data use travels on fixed networks and why fiber is economically justified for dense urban areas. In parallel, the COMESA-IDEA programme targets regional digital inclusion and harmonisation, offering a lawful anchor for shared services and for the integrated scaling of e-government and procurement systems that will drive usage upward over the mandate horizon.

Streaming and Application Bitrates.

For dimensioning of peak loads, platform guidance indicates typical viewing streams of 1080p require ~5 Mbps and 720p ~3–6 Mbps; live ingestion recommendations for 1080p60 can reach ~12 Mbps. These values serve as reasonable proxies for upper-bound concurrency loads. Cisco's VNI further notes that busy-hour traffic grows faster than average traffic, highlighting the need to size networks for peak rather than mean loads. Sandvine's Global Internet Phenomena reporting confirms that on-demand video dominates downstream traffic and that YouTube/Netflix are among the primary drivers, reinforcing the throughput assumptions used herein.

Urban Reference (Juba).

Recent urban-agglomeration estimates place Juba's 2025 metro population at ~500,000, with national internet usage around 12% in 2024 and rising per national sources; the modelling below deliberately anticipates 1,000,000 active users for the design steady state under DPFIP rollout and COMESA-aligned digitalisation, reflecting the long-run target rather than transitory usage.

Method and Assumptions (summary).

We compute monthly and daily volumes for three adoption scenarios, then apply a busy-hour fraction (BH%) of 12% of daily traffic to derive hourly throughput. BH% selection reflects common traffic-engineering practice—planning for the busiest hour of the day—and is cross-referenced to ITU busy-hour measurement principles and standard network operations literature. Sensitivity can be tested at 10–15% without altering the conclusion that fiber capacity is justified.

Scenario Definitions.

1. **Baseline (mobile-centric)**: 1,000,000 mobile users; 3.1 GB/month per user. 2) Blended (early fiber uptake): 30% fixed users at 130 GB/month; 70% mobile users at 6 GB/month. 3) Mature (broad fiber adoption): 50% fixed users at 200 GB/month; 50% mobile users at 15 GB/month. ITU per-subscription benchmarks inform fixed vs mobile figures; mobile values assume modest growth and Wi-Fi offload as digital services mature.

Computed Results (Python modelling).

We executed a simple deterministic model to quantify monthly, daily, and busy-hour values for 1,000,000 users; outputs are summarised below and provided as a CSV for auditability.

Table 13.1: Scenario Results (1,000,000 Users; BH% = 12%)

Scenario	Monthly Data (PB)	Annual Data (PB)	Annual Data (EB)	Busy Hour Avg (Gbps)
Baseline (mobile-centric)	3.10	37.2	0.037	27.6
Blended (early fiber uptake)	43.20	518.4	0.518	384.0
Mature (broad fiber adoption)	107.50	1,290.0	1.290	955.6

Interpretation.

Under blended adoption (already modest fiber uptake), Juba would carry ~1.44 PB daily, with a busy-hour average ~384 Gbps. Under mature adoption, daily traffic grows to ~3.58 PB, requiring ~956 Gbps on average during the busiest hour, exclusive of redundancy, protection switching, and burst buffers. These magnitudes are consistent with ITU global traffic distributions that show heavy usage on fixed networks and with Sandvine's finding that video dominates downstream traffic in both fixed and mobile contexts.

Streaming Concurrency Stress-Test.

To dimension short spikes, we compute peak streaming throughput assuming **10%, 20%, 30%** of users concurrently streaming at representative bitrates (3 Mbps, 5 Mbps, 12 Mbps) and add 30% headroom for protocol/CDN/ABR overhead.

Table 13.2: Streaming Peak Throughput (Concurrency; Per-Stream Bitrate)

Concurrency	Per-Stream (Mbps)	Aggregate (Gbps)	With 30% Headroom (Gbps)
10%	3.0	300.0	390.0
10%	5.0	500.0	650.0
10%	12.0	1,200.0	1,560.0
20%	3.0	600.0	780.0
20%	5.0	1,000.0	1,300.0
20%	12.0	2,400.0	3,120.0
30%	3.0	900.0	1,170.0
30%	5.0	1,500.0	1,950.0
30%	12.0	3,600.0	4,680.0

Implications for Fiber Core and Access Design.

Even in conservative concurrency, hundreds of Gbps are demanded in short windows, and >1 Tbps with reasonable buffers in higher concurrency or live events. That level necessitates: (i) metro core rings with multiple 100G/400G wavelengths and upgrade paths to 800G; (ii) dual-homed upstream connectivity and regional peering; (iii) CDN caches and in-country content localisation to keep path lengths and costs down; and (iv) ODN architectures (PON/FTTx) dimensioned for peak busy-hour rather than mean consumption, with split ratios adapted to urban density and service mix. These choices are fully consistent with ITU traffic-engineering principles and the empirical reality that fixed networks carry the "heavy" workloads.

Economic Rationale and REC Alignment.

At blended/mature adoption, monthly volumes in the 43–108 PB range and busy-hour averages of ~384–956 Gbps create a compelling case for fiber investment, particularly when paired with open contracting and e-government workloads that benefit from low-latency, high-reliability infrastructure. COMESA-IDEA's regional policy and capacity platform further reduces duplication and enables shared services (e.g., regional analytics hubs and cloud hosting), improving ROI and interoperability across borders.

Sensitivity and Validation.

If BH% were reduced to **10%**, busy-hour Gbps values fall proportionally, but the strategic conclusion remains unchanged. Likewise, if fixed-line monthly usage adopted the high-income benchmark (~435 GB/sub), the mature scenario values would increase materially. Cisco's busy-hour growth observation and Sandvine's application mix data support precautionary sizing—provisioning for peaks is prudent policy for sovereign services.

References

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- **Busy-Hour / Traffic-Engineering**: ITU-T E.500 traffic intensity measurement principles: ITU E.500; IBM busy-hour basics: IBM; Cisco traffic analysis: Cisco.

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- **Application Mix / Peaks**: Sandvine Global Internet Phenomena 2024 (video dominance; YouTube/Netflix traffic): CSI summary.

- **Urban Context & Penetration**: Juba metro population (2025): Macrotrends; national digital usage (2024): DataReportal; national press note on 2025 internet penetration: One Citizen Daily.

Closing Statement

The DESA Public Finance & Procurement Integrity Programme (DPFIP) is hereby presented as a sovereign, ethical, and bankable instrument that operationalises governance integrity through open contracting standards, AI-assisted fiduciary oversight, and regionally harmonised digital procurement systems. Chapters 3 to 5 establish the strategic objectives and institutional architecture that secure legality, accountability, and continuity; Chapters 6 and 7 codify fiduciary safeguards and compliance ethics aligned to continental norms; Chapters 8 and 9 demonstrate lawful regional replication and the economic rationale for market activation, donor confidence, and value-for-money; Chapters 10 and 11 set a binding MRV regime and a participatory capacity framework; and Chapters 12 and 13 consolidate partner entry conditions with quantified capacity for urban deployment. For the Juba case (1,000,000 users), the programme's blended and mature adoption scenarios translate to 518.4 PB/year (~0.518 EB) and 1,290 PB/year (~1.29 EB) respectively, with busy-hour averages of ~384 Gbps and ~956 Gbps, thereby substantiating the necessity of fiber metro cores, regional peering, CDN localisation, and resilient access networks sized to peak rather than mean consumption. The result is a coherent, end-to-end design that meets the prudential and developmental criteria of multilateral financing (AfDB and partners), embeds transparency and inclusion at each stage of the procurement lifecycle, and provides the State with a durable, audit-ready pathway to redirect savings into essential services while strengthening public trust.