

Mechanical Systems & Technical Development

Can this project exist — and remain serviceable — over the next 30 years?

PlayForward
Las Tumbas, Costa Rica

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Original PlayForward field documentation, 2025–2026.

TRACK LENS	MSTD tests whether physical systems can be accessed, constructed, protected, maintained and renewed under real site conditions.
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01 | Executive Finding

Technical viability depends on designing for the conditions that will actually govern the asset.

The MSTD assessment examines whether PlayForward’s physical systems can remain **functional, durable, safe and maintainable over time**. Rather than evaluating infrastructure as a series of isolated construction activities, the track considers the full operating environment: site access, climate exposure, material performance, maintenance capacity and expected asset life.

The assessment finds that the existing site provides a viable foundation for continued development, including established access, covered community infrastructure and existing recreation assets. The principal technical constraints are not whether improvements can be built, but **how they should be designed, specified and maintained under local conditions**. The May–November rainy season affects access and scheduling; persistent humidity, storms, termites and insects influence material performance; and ongoing maintenance depends on a limited onsite caretaker base supported by approximately 4–6 volunteers.

5 Condition areas	May–Nov Rainy season	4–6 Volunteer support	3 Priority mini-projects	30 yrs Longest plotted life
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EXECUTIVE IMPLICATION	A capital improvement is technically viable only when the site can access it, construct it, protect it, maintain it and ultimately renew it under realistic operating conditions. MSTD therefore evaluates not only whether an asset can be delivered, but whether its expected service life can be sustained.
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TECHNICAL DECISION LENS

ACCESS → CLIMATE → MATERIALS → MAINTENANCE → LIFECYCLE



Site context. The project's physical setting establishes the access, environmental exposure and operating conditions against which proposed improvements must be evaluated.

02 | Access & Delivery

Feasible access does not eliminate logistics risk; it defines the operating window.

The source places the site off a paved highway, reached by a straight, flattened gravel road described as firm enough for trucks and slightly softer during the rainy season. That distinction matters: the assessment does not identify the site as inaccessible. Instead, it establishes a logistics condition that should be incorporated into procurement and construction planning.



Road and site-access context documented onsite.

DELIVERY IMPLICATION

Wood, steel and roofing materials can reach the site, but wet-season access should be treated as a scheduling and delivery variable rather than an afterthought.

What this means for implementation

- Sequence heavy or time-sensitive deliveries around known wet-season conditions where practical.
- Confirm transport assumptions before procurement of oversized or weather-sensitive materials.
- Protect staged materials from humidity, rainfall and short-duration storms once delivered.
- Maintain a simple delivery record linking supplier, material, arrival condition and intended installation area.

03 | Existing Infrastructure

The starting point is not a blank site; it is an operating physical system.

PlayForward’s technical baseline includes existing covered community infrastructure, recreation areas, furniture and equipment that remain in active use. The assessment therefore begins with the existing asset base—not proposed construction—to determine what should be preserved, rehabilitated, adapted or ultimately replaced.

EXISTING ASSET	CURRENT CONDITION	TECHNICAL READING
El Salon / covered space	Existing covered community infrastructure	Preserve the existing structure while addressing identified condition deficiencies before considering replacement.

EXISTING ASSET	CURRENT CONDITION	TECHNICAL READING
Play / recreation area	Existing recreation system	Assess safety, durability and projected capacity before determining whether rehabilitation or expansion is required.
Benches / tables	Well built, varnished and weather treated	Maintain protective finish and use lifecycle-based replacement rather than premature disposal.



Existing covered infrastructure provides a serviceable asset base for rehabilitation, maintenance and future capacity planning.

ASSET PRINCIPLE	Preserve serviceable assets first. Rehabilitate or adapt where condition and function support continued use; replace only when lifecycle, safety or capacity requirements justify new capital investment.
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04 | Maintenance Capacity

Infrastructure scale should remain proportionate to the people available to care for it.

The source identifies a few primary onsite caretakers with occasional volunteer support of approximately 4–6 people. That maintenance base is a technical constraint in the same way that climate or access is a constraint. A system can be buildable and affordable at installation while still becoming unsustainable if routine care exceeds local capacity.



Ongoing lawn and site-maintenance activity documented in the source.

4–6 Volunteer support	Few Primary caretakers	LOW-COMPLEXITY Preferred maintenance profile	Local Serviceability required
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MAINTENANCE CAPACITY TEST

- **Can routine inspection be completed without specialist support?**
- Can cleaning, sealing, painting or minor repair be performed with locally available labor and tools?
- **Are replacement parts and consumables realistically obtainable?**
- Does the proposed asset create a recurring maintenance burden that is disproportionate to its community value?

OPERATING CAPACITY → ASSET REQUIREMENT

Operating Reality	Technical Requirement
Few primary caretakers	Low-complexity systems
4–6 volunteer support	Tasks that can be safely distributed
Local maintenance capacity	Locally serviceable materials and components
Routine maintenance demand	Predictable inspection and renewal cycles

The constraint is not simply labor availability; it is organizational capacity. Proposed assets should therefore minimize specialist dependency, difficult-to-source components and maintenance requirements that exceed the site's routine operating capability.

DESIGN IMPLICATION

Favor systems that can be inspected, maintained and renewed using locally available skills, tools and replacement components. Technical sophistication should not introduce dependencies that the site cannot independently sustain.

05 | Climate, Materials & Exposure

Material performance is governed by moisture, storms and biological exposure.

The technical source identifies a May–November rainy season, high humidity throughout the year, periodic storms or mini-downpours, and exposure to termites and insects. These are not background environmental details; they are material-selection criteria.

EXPOSURE	SOURCE SIGNAL	DESIGN RESPONSE
Rainfall / humidity	Rainy season May–Nov; high humidity year round	Use moisture-aware detailing, coatings, storage and installation sequencing.
Storms / downpours	Short-duration weather events can affect wood and other materials	Protect staged materials and avoid exposed installation where practical.
Termites / insects	Biological exposure documented	Use sealed and chemically treated materials where appropriate.
Outdoor service	Assets remain exposed after installation	Specify finishes and inspection intervals that anticipate recurring exposure.

MATERIAL SELECTION IMPLICATIONS

Design Consideration	MSTD Interpretation
Moisture Resistance	Favor materials, coatings and connections capable of repeated exposure to high humidity and seasonal rainfall.
Biological Resistance	Wood and other vulnerable components should incorporate appropriate treatment, sealing and inspection for termites and insects.
Repairability	Favor components that can be inspected, repaired or replaced locally without specialized equipment or proprietary systems.
Weathering	Exterior finishes and exposed assemblies should be selected with recurring maintenance and renewal intervals in mind.
Installation Timing	Weather-sensitive work should be sequenced around rainfall exposure and materials should be protected during storage and installation.

TECHNICAL INTERPRETATION

The appropriate material is not necessarily the material with the longest theoretical lifespan. MSTD should favor the option that provides the strongest combination of **durability, environmental resistance, local availability, maintainability and realistic replacement capacity** under PlayForward’s operating conditions.

MATERIAL DECISION LENS

EXPOSURE → RESISTANCE → SERVICEABILITY → MAINTENANCE → EXPECTED LIFE

Material specifications should be evaluated against the environment in which the asset will actually operate—not against nominal performance under ideal conditions.



Material evidence associated with technical delivery.

SPECIFICATION RULE

Field condition. Material selection must account for recurring moisture, biological exposure and outdoor service conditions documented at the site.

06 | Capital Improvement Priority

Technical urgency should distinguish immediate functionality from longer-horizon enhancement.

The source identifies three priority mini-projects—raised fence section, La Bodega expansion and lawnmower replacement—while separately identifying Bathrooms, El Salon and the Play Area as high-urgency/high-benefit areas. These findings represent different types of technical priorities: some address immediate condition or functionality, while others strengthen capacity, safety or maintainability. MSTD therefore distinguishes **technical urgency from capital sequencing**.

TECHNICAL PRIORITY RULE

Urgency + Functional Benefit + Condition + Maintainability → Technical Priority

PRIORITY VIEW	SOURCE ITEMS	TECHNICAL INTERPRETATION
High urgency / high benefit	Bathrooms; El Salon; Play Area	Conditions with stronger immediate implications for continued use and community function.
Priority mini-projects	Raised fence section; La Bodega expansion; lawnmower replacement	Discrete interventions that can strengthen safety, capacity or maintenance capability.
Lower urgency / lower-to-medium benefit	Kitchen; Storage	May be sequenced after higher-priority technical needs unless another track elevates the issue.



Site context. Recreation infrastructure illustrates why technical priority must consider both present condition and the ability of an asset to support continued community use.

CROSS-TRACK DECISION RULE

MSTD establishes technical priority, not the final investment sequence. CROI may elevate an intervention because of operational risk, while IGFO may alter timing based on cost, funding availability or portfolio priorities. Final capital sequencing should reconcile all three views.

07 | Lifecycle & Renewal

A 30-year asset horizon requires maintenance planning, not simply durable construction.

The source compares expected service life and maintenance frequency across interior finishes, kitchen equipment, benches, roofing and playground assets, with the longest planning horizon extending to approximately 30 years. The management implication is more important than any individual lifespan estimate: every capital asset creates a future cycle of inspection, maintenance, rehabilitation and eventual replacement.

LIFECYCLE MANAGEMENT APPROACH

PRESERVE	Protect serviceable assets through routine inspection, sealing, cleaning and minor repair.
MAINTAIN	Match maintenance frequency to exposure and use rather than waiting for visible failure.
RENEW	Plan replacement or rehabilitation before an asset becomes a safety, operational or cost escalation issue.
RECORD	Keep a simple auditable asset history so future cohorts can distinguish age, condition, work completed and next action.
REPLACE	Replace when continued repair is no longer justified by condition, safety, functionality or remaining service life.

ASSET LIFECYCLE

INSTALL → INSPECT → MAINTAIN → REHABILITATE → REPLACE



Material and procurement evidence illustrates that lifecycle planning begins at specification and purchase—not when deterioration becomes visible

For PlayForward, lifecycle management reduces the risk of repeatedly funding the same underlying problem and provides future technical teams with a defensible basis for deciding whether to **preserve, repair, rehabilitate or replace** an asset.

CAPITAL PLANNING IMPLICATION	Initial cost is only one component of asset value. Technical decisions should consider expected service life, maintenance frequency, repairability and eventual replacement requirements before capital is committed.
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08 | Cross-Track Interpretation & Actions

Technical viability is one decision dimension — not the final decision by itself.

MSTD establishes whether an intervention is technically viable, but technical viability does not establish whether capital should be deployed. A physically serviceable system may still carry operational vulnerabilities identified by CROI, require different financial sequencing under IGFO, or create future capacity implications identified through RSI. The four-track model therefore preserves these distinctions and brings them together at the point of decision.

IGFO	CROI	MSTD	RSI
Can we fund and sequence it responsibly?	What could disrupt safe or continuous operation?	Will it remain functional and maintainable?	What does the evidence imply for future capacity?

INTEGRATED CAPITAL DECISION

Capital should proceed only when financial sequence, operational risk, technical viability and future capacity have been considered together.

ACTION FRAMEWORK

- Immediate — verify the highest-priority physical conditions onsite before final specification.
- Near-term — specify sealed or termite-treated materials where supported and sequence work around rainy-season conditions.
- Implementation — document materials, installation date, supplier, responsible party and maintenance expectation.
- Longer-term — size future infrastructure to caretaker and volunteer capacity and refresh lifecycle assumptions as conditions change.

MSTD DECISION PRINCIPLE

Technical viability is a threshold, not an authorization to spend. An intervention should advance only when it can be constructed, maintained and renewed within the site’s environmental and operating constraints—and when the broader four-track assessment supports deployment.

VERIFY → SPECIFY → SEQUENCE → DOCUMENT → MAINTAIN

Onsite work context reinforces the relationship between infrastructure and maintenance capacity.

09 | Conclusion & Method Note

Build for serviceability, not simply for completion.

Conclusion

The MSTD assessment establishes a practical technical position for PlayForward: the site has a viable physical foundation, but long-term resilience depends on disciplined specification, climate-responsive construction, realistic maintenance requirements and lifecycle planning.

The strongest technical intervention is therefore not necessarily the largest or most permanent. It is the intervention that can be delivered under actual site conditions, withstand environmental exposure, remain proportionate to local maintenance capacity and continue to provide value throughout its intended lifecycle.

For capital planning, MSTD establishes a clear threshold: an asset should not advance solely because it can be built. It should advance because it can be built, operated, maintained and renewed responsibly.

Technical governance sequence

CONDITION → ACCESS → EXPOSURE → SPECIFICATION → INSTALLATION → MAINTENANCE → RENEWAL

Method & Source Note

Primary source: TOMA BARRE EDUCATION, 2025–2026 Global Development Presentation, PlayForward, source slides 33–42; Section Briefing 05 of 09. This collection edition reorganizes source-supported findings into an executive technical narrative. Original field imagery is retained as contextual evidence. Where the source provides qualitative rather than engineering-grade measurements, the language remains qualitative and should not be read as a stamped engineering assessment.



Local sourcing context reconnects technical specification to delivery conditions.

FINAL PRINCIPLE

Technical success is measured across the asset lifecycle—not at construction completion. A viable system is one that can function, withstand its operating environment, be maintained locally and be renewed when conditions require it.