Inspira-Journal of Commerce, Economics & Computer Science (JCECS)
(A National bi-lingual Quarterly Double Blind Open Access Peer Reviewed Refereed Journal)
ISSN : 2395-7069(Print), Impact Factor: (Cosmos 7.650 & I2OR 5.120), Volume 12, No. 03, July-September, 2026, pp. 128-134

A Study on Evaluating Truck Turnaround Time at Calyx CFS

Harish Kumar.R[1] Dr. Anitha Kumari. D[2*]

[1]Logistics and Supply Chain Management, Department of Management Studies, School of Management Studies, Vels Institute of Science, Technology and Advanced Studies (VISTAS), Chennai.
[2]Associate Professor Department of Management Studies, School of Management Studies, Vels Institute of Science, Technology & Advanced Studies, (VISTAS), Chennai.

[*]Corresponding Author: anitha.sms@vistas.ac.in

Citation: *Kumar, H. & Kumari, A. (2026). A Study on Evaluating Truck Turnaround Time at Calyx CFS. Journal of Commerce, Economics & Computer Science, 12(03), 128–134. https://doi.org/10.62823/jcecs/12.03.9382*

Abstract

Container Freight Stations (CFS) sit at a critical junction in India's import-export supply chain, bridging the gap between ports and inland transport. At these facilities, the time a truck spends completing gate entry, documentation, customs checks, cargo handling and gate exit. Its "turnaround time" is one of the clearest signals of how efficiently the station is run. This article examines that question at Calyx Container Freight Station in Chennai, drawing on a 60-respondent survey of CFS managers, customs executives, shipping-line staff and yard supervisors conducted as part of an MBA internship study. The findings paint a picture of a facility with strong infrastructure and a well-established market position, but one where documentation delays, uneven equipment availability and inconsistent turnaround times continue to hold back operational performance.

Keywords: *Container Freight Stations, Supply Chain, Inland Transport, Cargo Handling, Turnaround Time.*

Introduction

Industry and Company Context

India's logistics sector has expanded rapidly alongside growth in manufacturing, trade and e-commerce, and the government has repeatedly flagged logistics efficiency — including CFS performance — as a lever for national competitiveness. Tamil Nadu, and Chennai in particular, sits at the centres of this activity thanks to its industrial base, port infrastructure and road and rail connectivity. Calyx Container Terminals Pvt. Ltd., part of the SG Group, has operated a CFS in Puzhal, Chennai since it was established in September 2006, offering gate operations, documentation processing, customs coordination, cargo handling, yard management and container-location services to importers, exporters, transporters and customs agents.

A truck's journey through Calyx CFS typically follows a fixed sequence: gate entry, documentation and verification, weighing, customs examination where applicable, yard and cargo handling, loading or unloading, billing clearance, and finally gate exit. Because these steps depend on different departments operations, documentation, customs coordination, yard management and equipment maintenance a delay anywhere in the chain extends the total time a truck spends on site. That total, the truck turnaround time, is the study's central performance measure.

Research Methodology

The study combined primary and secondary data collection. Primary data came from a structured questionnaire administered to 60 respondents directly or indirectly involved in Calyx CFS operations, selected through convenience sampling because of the time constraints of an internship placement. The questionnaire used a mix of closed-ended and five-point Likert-scale questions grouped into three sections: respondent background, operational factors affecting turnaround time, and process-optimization perceptions. Direct observation of gate, yard and documentation activity, and informal discussions with supervisors and staff, supplemented the survey. Secondary data was drawn from company records, standard operating procedures, government logistics reports and published research on container-terminal operations.

To interpret the causes of delay, the study applied a Fishbone (Ishikawa) analysis, sorting contributing factors into six standard categories: People (manpower and coordination), Process (documentation and clearance steps), Methods (scheduling and SOPs), Machines/Technology (equipment and IT systems), Materials/Environment (yard congestion, traffic), and Management (planning and monitoring). This framework is used throughout the data analysis below to connect individual survey findings to root causes.

The CFS Process, Step by Step

Understanding where time is lost requires breaking the journey into its component stages rather than treating turnaround time as a single number. At Calyx, the sequence runs from truck entry at the gate, through documentation and verification, weighing, customs-related activity where the cargo requires examination, yard and cargo-handling operations, loading or unloading, billing and clearance, and finally exit through the gate.

Each stage depends on a different combination of people, equipment and information, and each is a potential point of failure for the stages that follow it.

A truck that clears the gate quickly but then waits on paperwork gains nothing from the fast gate entry; likewise, available equipment is of limited value if customs clearance is still pending.

This interdependence is why the study treats turnaround time as a system-level measure rather than a collection of independent steps, and why the Fishbone analysis later in this article groups cause by category rather than by individual process stage.

Four operational factors recur across the report as the primary levers affecting how long any given stage takes: the availability and deployment of people across departments; the condition and sufficiency of handling equipment such as forklifts, reach stackers and weighing systems; the accuracy and speed of paperwork moving between transporters, CFS staff and customs; and the degree of congestion inside the yard itself, particularly during peak arrival windows.

Communication and coordination between these functions rather than any single function in isolation is repeatedly identified as the deciding factor in whether a truck's total time on site stays close to the facility's best-case numbers or drifts toward its worst-case ones.

Respondent Profile

Of the 60 respondents, 50% were female, 43.3% male and 6.7% preferred not to disclose gender, giving the study a reasonably balanced perspective.

Respondents skewed young: 38.3% were under 25 and 30% were between 25 and 35, though 21.7% were between 35 and 45 and 10% were over 45, so the sample still captured more experienced viewpoints.

Educationally, 46.7% held undergraduate degrees and 31.7% held postgraduate degrees, meaning nearly four in five respondents (78.4%) had at least a graduate-level qualification.

By functional role, customs executives were the largest single group (45%), followed by shipping-line personnel (30%), yard supervisors (13%) and CFS managers (12%) — a distribution that skews the findings toward documentation- and clearance-related insight.

Consistent with that, 58.1% of respondents said they interact with CFS operations either daily or a few times a week, indicating that most of the sample had regular, first-hand exposure to the processes being evaluated.

Respondent Attribute	Category	Respondents
Gender	Female	50.0%
Gender	Male	43.3%
Age	Below 25	38.3%
Age	25–35	30.0%
Primary Role	Customs Executive	45.0%
Primary Role	Shipping Liner	30.0%
Experience in CFS Logistics	Less than 1 year	35.0%
Interaction with CFS Ops	Daily or a few times/week	58.1%

What Recent Research Says

The study situates its findings within a broader body of container-terminal research published between 2022 and 2026, most of which focuses on truck appointment systems, yard-resource coordination and, increasingly, data-driven and machine-learning approaches to scheduling. Sunet. (2022) and later Sun et al. (2025) both find that data-driven appointment quotas allocating gate-entry slots based on observed arrival and processing patterns rather than a first-come basis measurably reduce truck turnaround time. Azab and Morita (2022) and Duan et al. (2024) extend this by showing that appointment scheduling only delivers its full benefit when coordinated with container-relocation and yard-retrieval activity, echoing this study's own observation that gate-level fixes are ineffective if yard or documentation capacity is not addressed in parallel.

A second cluster of research examines yard optimization directly: Gurgen (2023) reports measurable reductions in yard clashes and handling delays from integer-optimization models applied to container placement, while more recent work by Cooper (2025) and Villalobos et al. (2026) applies machine learning to predict container dwell times and service requirements, allowing terminals to plan equipment and manpower ahead of demand rather than reacting to it. A third theme, visible in Nadi et al. (2023) and the broader 2025 review of truck-appointment models, is the shift toward decision-support systems that balance the interests of terminal operators, truck operators and customs authorities simultaneously rather than optimizing any one stakeholder's throughput in isolation.

How Long Does a Truck Actually Wait?

Asked about the current end-to-end turnaround time for an import container from gate-in to gate-out 45.5% of respondents reported 1–2 hours. A further 21.8% reported 30–60 minutes, but a combined 32.7% reported turnaround times of 2–4 hours or more than 4 hours. That tail is significant: roughly one in three respondents is describing a turnaround experience well outside what would be considered efficient for routine import processing.

Turnaround Time	Respondents	Percentage
30–60 minutes	13	21.8%
1–2 hours	28	45.5%
2–4 hours	12	20.0%
More than 4 hours	7	12.7%

Consistency is arguably a bigger concern than the average itself. When asked to rate how consistent turnaround times are, 47.2% of respondents (28 of 60) described them as inconsistent or very inconsistent, versus only 20% who called them consistent or very consistent, with the remainder neutral.

A process that is sometimes fast and sometimes very slow is harder for transporters to plan around than one that is uniformly moderate — and this variability is itself identified in the report as a significant operational concern.

Respondents were also asked when turnaround tends to be worst. Night was the most frequently cited period (40%), followed by afternoon (32.7%), suggesting that staffing levels, equipment availability or coordination may thin out during off-peak hours even as trucks continue to arrive a classic capacity-versus-demand mismatch rather than a problem confined to daytime congestion alone.

Documentation

Documentation emerges as the most consistently cited source of delay in the study. Asked to rate the speed and clarity of the current documentation process, 43.6% of respondents rated it slow or

very slow, compared with just 29.1% who rated it fast or very fast — a negative balance that stands out against the more evenly split ratings for other factors.

Digging into which specific documentation step causes the most delay, billing clearance was cited most often (29.1%), narrowly ahead of customs examination (34.5% when measured on its own scale) and internal CFS gate formalities (27.3%); the delivery-order step was the least implicated (9.1%).

In other words, delay is not concentrated in one isolated step but spread across the clearance-and-billing portion of the process, which typically requires coordination across multiple departments and external parties.

Documentation Step	Respondents	Percentage
Customs examination	19	34.5%
Billing clearance	20	29.1%
Internal CFS gate formalities	15	27.3%
Delivery order	6	9.1%

Compounding this, more than half of respondents (54.6%) said they frequently or very frequently encounter corrections in documentation that delay cargo release, versus only 16.4% who said this rarely happens.

Rework of this kind — re-checking, re-submitting, or clarifying paperwork — adds time on top of the baseline processing steps and is one of the more addressable causes of variability in turnaround time, since it stems from process design rather than external customs timing.

Equipment and Technologies

On cargo-handling equipment — forklifts, reach stackers and similar machinery — the picture is mixed. The largest single group of respondents (34.5%) rated current equipment as "just sufficient" for peak-hour volumes, a phrase that itself signals limited slack in the system.

Combined, 30.9% rated equipment as inadequate or more inadequate, versus 34.6% who rated it adequate or more than adequate. The absence of a comfortable buffer suggests that any spike in volume, or any equipment breakdown, is likely to translate quickly into truck queuing.

IT systems CFS software, the customs interface and the transporter portal received more polarized ratings. Roughly 43.6% of respondents rated reliability and integration as poor or very poor, while 29% rated it good or excellent, and 27.3% were neutral.

This split suggests uneven system performance or uneven system usage across departments, consistent with the report's broader observation that Calyx has invested in technology but has not yet achieved full integration across documentation, customs and transporter-facing systems.

Rating	Equipment Adequacy	IT System Reliability
Very poor / More inadequate	10.9%	23.6%
Poor / Inadequate	20.0%	20.0%
Neutral / Just sufficient	34.5%	27.3%
Good / Adequate	27.3%	14.5%
Excellent / More adequate	7.3%	14.5%

The practical implication is that Calyx's technology and equipment layers are not the facility's weakest link in absolute terms — documentation clearly ranks worse — but they are not strong enough to compensate for documentation friction either. A more reliable, better-integrated IT layer could, in principle, reduce documentation-driven delay directly, by cutting down on the manual re-entry and cross-checking that generates the corrections respondents describe. That makes technology investment and documentation reform complementary rather than competing priorities: neither is likely to fully solve the turnaround-time problem on its own.

Root-Cause Analysis: Why Delays Happen

Applying a Fishbone (cause-and-effect) framework to the survey and observational data groups the drivers of turnaround-time variation into six categories, summarized below.

People

- Insufficient manpower during peak hours
- Lack of coordination between CFS staff, customs agents and transporters

Process

- Lengthy customs clearance procedures
- Multiple approval stages before billing clearance

Methods and Management

- Absence of consistently applied scheduling for cargo movement
- Limited monitoring of turnaround time as an ongoing performance metric

Machines, Materials and Environment

- Equipment that is "just sufficient" rather than comfortably adequate
- System downtime and manual data entry in IT platforms

Read together, these categories point to a consistent theme: Calyx CFS core physical infrastructure and market position are strong, but the softer layers of the operation documentation accuracy, cross-department coordination, off peak staffing and system integration are where turnaround-time variability originates.

Key Findings

- Manual documentation, and the corrections it generates, is the single largest identified source of delay.
- Turnaround time is most often 1–2 hours, but roughly one in three trucks experiences 2 hours or more.
- Consistency is a bigger concern than average speed: nearly half of respondents view turnaround times as unpredictable.
- Night and afternoon periods see the worst turnaround performance, pointing to staffing or resourcing gaps outside peak daytime hours.

Recommendations

- **Digitize and Integrate Documentation**

Because documentation and its downstream corrections are the most cited source of delay, the highest-leverage intervention is to move remaining manual documentation steps onto digital workflows that connect directly to customs systems. Built-in validation checks at the point of data entry would reduce the corrections that currently affect more than half of transactions, cutting rework rather than simply speeding up the original process.

- **Rebalance Staffing to Match Demand Patterns**

Given that night and afternoon periods are most frequently identified as the worst for turnaround time, shifting manpower allocation — rather than simply adding headcount — could close the gap between truck arrivals and available processing capacity during these windows.

- **Build a Turnaround-Time Monitoring Dashboard**

A live dashboard tracking time-in-stage (gate entry, documentation, customs, yard, exit) would let management identify bottlenecks as they occur rather than through periodic survey-based review, and would make it possible to measure whether process changes are actually improving consistency, not just average time.

- **Equipment Buffer for Peak Periods**

Since equipment was most often rated "just sufficient," even modest additional capacity — or a flexible-hire arrangement for peak periods — would reduce the risk that a single breakdown or volume spike cascades into yard-wide delays.

- **Strengthen Cross-Stakeholder Coordination**

Formal coordination touchpoints between CFS staff, customs agents and transporters.For example, scheduled handoff checkpoints or shared status visibility would address the coordination gaps identified in the People category of the root-cause analysis, without requiring major capital investment.

Conclusion

The evidence from this 60-respondent study of Calyx Container Freight Station points to a facility that is fundamentally well-positioned with established infrastructure, a strong Chennai location and nearly two decades of operating history, but whose turnaround-time performance is held back by documentation friction, uneven staffing across time periods, and technology that is present but not fully integrated. None of the improvement levers identified require reinventing the facility's operations; they involve tightening the coordination, monitoring and consistency of processes that already exist.

Appendix: Survey

No	Survey Question	Leading Response	Share
1	Gender	Female	50.0%
2	Age	Below 25	38.3%
3	Educational qualification	Undergraduate	46.7%
4	Department	General	38.0%
5	Primary role	Customs executive	45.0%
6	Experience in CFS logistics	Less than 1 year	35.0%
7	Interaction frequency with CFS ops	Few times a week	34.5%
8	End-to-end turnaround time	1–2 hours	45.5%
9	Consistency of turnaround times	Neutral	32.7%
10	Worst turnaround period	Night	40.0%
11	Documentation speed/clarity	Slow	29.1%
12	Step causing most delay	Billing clearance	29.1%
13	Frequency of correction-related delay	Frequently	36.4%
14	Equipment adequacy for peak volumes	Just sufficient	34.5%
15	IT system reliability/integration	Average	27.3%

For reference, the table above consolidates the largest response category for each of the study's fifteen substantive survey questions, giving a single-page view of the overall data set behind the analysis in this article.

Study Limitations

As with any internship-based study, these findings should be read alongside a few constraints on scope. The research covers Calyx CFS only, so the specific proportions reported here such as the 45.5% of respondents citing a 1–2hour turnaround should not be generalized to other CFS facilities without independent verification. The sample of 60 respondents, while adequate for identifying broad patterns, was drawn using convenience sampling during a limited internship period rather than a fully randomized design, and the primary data reflects staff perception rather than direct time-stamped operational logs, which were not accessible for confidentiality reasons.

Turnaround time is also shaped by factors outside the facility's control customs policy changes, port congestion, and seasonal cargo volume that this study did not attempt to isolate. These constraints do not undermine the core findings, which are broadly consistent with the wider 2022–2026 literature on CFS and terminal operations, but they do mean the specific recommendations in Section 9 should be validated against operational data before large-scale implementation.

References

1. Jeong, D., & Woo, (2024). *A Study on the Prediction of Truck Turnaround Time per Hour in Container Terminals Using Big Data.*
2. Baldouski, D., Kresz, M., & David, B. (2025). *Scheduling Truck Arrivals for Efficient Container Flow Management in Port Logistics.*
3. Kimet (2025). *Deep Learning-Based Estimation of Truck Turn Around Time at Container Port*

4. Marzo Grimalt, J. (2025). *Understanding Truck Turnaround Time in Container Terminals: Comparative Insights from Barcelona Europe South Terminal and Sun Kwang New Port Container Terminal.*

5. Ministry of Ports, Shipping and Waterways, Government of India (2025). *Time Taken for Container Freight Station (CFS) Containers after Dispatch from the Port.* NICDC Logistics Data Services (2024).

6. Shiraishi, D. *february (2024)*, Shibasaki.R(2026). *Port Performance Report -Examining Container Terminal Efficiency with Diverse Data Sources: Vessel, Truck, and Container Turnaround Times in Japanese Terminals.*

Source and Editing Note

This article was prepared from the uploaded research report titled “REPORT FINAL.pdf. The wording has been condensed and humanized into article form, while the reported objectives, methodology, statistical values, findings, recommendations, and references have been retained. No external research was added to change the study’s results.

❑❑❑