Case study

Building a $7 billion fab in under two years

How an empowered core team and integrated master schedule overcame a two-year projected delay

FTTM case study series.

GlobalFoundries Fab 8 start-up. Malta, New York, 2009–2011. The FTTM framework converted a projected two-year delay into a two-week early delivery.

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Date
April 2026
Case study

Online
lateralworks.com
FTTM case study series

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Core thesis. A two-year deficit doesn't close incrementally. It closes when an empowered core team owns the outcome end-to-end, an integrated master schedule serves as the single source of truth, and refresh planning runs at a cadence frequent enough to expose gaps the same day they appear.

Overview

Abstract

In 2010, GlobalFoundries set out to build an advanced semiconductor fab in under two years. The company was newly formed, the site was a 225-acre greenfield in Luther Forest, a remote area of upstate New York, and the budget was $7 billion. The industry average for a project of this scale was three to four years. A major customer depended on the fab's output for a high-profile product launch, and every day of delay represented $5 million in lost profit.

The project was hit by compounding crises from day one. The 2010 global recession disrupted high-tech supply chains. The target semiconductor process changed twice in the first eight months — the first customer dropped out, and customer demand then drove a second shift to a process not yet qualified at the source fab in Dresden. Over half the tools and 70% of the utility and chemical infrastructure had to be redesigned. Remote-site logistics, union labor disputes, and intense media scrutiny added to the schedule pressure.

lateralworks was engaged to structure the program, build the integrated plan, and drive schedule acceleration using the Fast Time To Market (FTTM) framework. The initial macro plan showed the project tracking about two years late. An empowered cross-functional core team, a macro-micro Integrated Master Schedule (IMS) that grew to more than 100,000 tasks, and twice-daily Refresh Planning across 24/7 shifts closed the gap, pulled more than a year out of the schedule, and accelerated construction by three months.

First qualified silicon came off the production line on December 27, 2011, two weeks ahead of the January 10, 2012 target. The early delivery avoided about $70 million in delay costs. GlobalFoundries adopted the FTTM planning system as the standard for subsequent fab expansions and advanced process node programs worldwide.

$7B	2 weeks	$70M	>1 year
Program budget	Ahead of schedule	Saved from early delivery	Schedule gap recovered

01

The context

A $7 billion race against time

GlobalFoundries was formed in 2009 when the sovereign wealth fund of Abu Dhabi acquired AMD's manufacturing operations, creating a pure-play semiconductor foundry. Its first new build was Fab 8, on a 225-acre greenfield site at the Luther Forest Technology Campus in Malta, New York.

The scope: build a complete fab facility and site infrastructure, procure 1,600 tools, transfer an advanced semiconductor process from GlobalFoundries' existing Fab 1 in Dresden, qualify it at Fab 8, start high-volume manufacturing, and recruit, relocate, and train 2,500 specialized employees. All in under two years, on a budget of about $7 billion.

Figure 1. Fab 8, Malta, New York—the most advanced pure-play semiconductor foundry campus in the United States. Over 3,300 employees, 460,000 sq ft clean room, leading-edge 14nm and 7nm process technologies.

On day one of 730, a five-person core team stood on an empty site in a remote corner of upstate New York. No local infrastructure, no labor pool, no supply chain. The target was one the industry considered impossible.

The stakes

A major customer had committed to take high-volume production from Fab 8 within two years, tying the fab's output to a new product release. The cost of delay was $5 million per day in lost profit to GlobalFoundries — a contractual penalty, not an internal planning target.

The project also carried public commitments. New York State had provided extensive tax credits and investment incentives, making Fab 8 the anchor of a high-tech economic revitalization program. GlobalFoundries had committed to hiring targets and infrastructure improvements as conditions of those subsidies, with financial penalties for missed commitments. Government oversight, regulatory constraint, and media scrutiny ran higher than on most industrial programs of comparable scale.

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The challenge

Compounding crises on an impossible timeline

The two-year target was already considered impossible. Fab projects of this scale averaged three to four years in 2010. The compressed timeline was the smaller half of the problem; the larger half was compounding instability that struck from every direction at once.

Customer and process instability

About six months in, the first customer dropped out. The fab start-up needed a new manufacturing process. Over half the tools were affected, and 70% of the utility, chemicals, and gases (GaC) matrix had to be redesigned. About eight months in, customer demand forced a second process change — this time to a process still in development at Fab 1 in Dresden, not yet qualified anywhere. The tool set and facility requirements were no longer fixed.

Global supply chain disruption

The project launched into the 2010 global recession. High-tech supply chains seized up; lead times for critical tools jumped. The team had to commit to tool orders before specifications were finalized — risk purchases, made to keep the schedule from slipping further.

Remote location and labor challenges

The remote site created its own logistics problem. Specialized construction workers and tool suppliers were hard to get to the campus. The local town restricted heavy vehicle traffic to specific hours, narrowing the delivery window. New York State contractors' unions disputed the use of out-of-state non-union labor. Specialized engineering talent was difficult to recruit; the area had none of the educational infrastructure or industry ecosystem of established semiconductor hubs.

External pressure

Media scrutiny was constant. New York State had positioned Fab 8 as the anchor of its high-tech economic revitalization program, which added political pressure on top of the technical and schedule pressure. Government regulations, environmental restrictions, and oversight requirements weighed on every major decision.

The diagnosis. The first end-to-end macro plan, built by lateralworks with the five-person core team, showed the project tracking about two years late. That was the diagnosis. The rest of the engagement was about closing the gap.

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The solution

The FTTM framework

lateralworks applied the Fast Time To Market (FTTM) framework to restructure the program around two interlocking systems: an empowered cross-functional core team, and an integrated master schedule with a high-frequency refresh planning cadence. The two work as one operating system. The team structure carries the schedule discipline; the schedule creates the urgency and transparency that keep the team focused.

The empowered core team

A single empowered leader — a Project Monarch — held full decision-making authority over technical and managerial issues across the entire scope. The Monarch protected the team from external “host interrupts”: the organizational noise, redirections, and competing priorities that pull a critical program apart inside a large corporation.

The core team started at five members for macro planning, then grew to 15 as the program scaled, with sub-core-teams embedded in each process module — Etch, Diffusion, Lithography, and others. Every member was a subject-matter expert selected for direct, relevant experience. There was no functional hierarchy; only cross-functional core teams, mapped to the Integrated Master Schedule. Partners and key suppliers were integrated into the same structure: one team, one project.

Culture mattered as much as structure. The program was a full-time mission for everyone on it. Team members were 100% dedicated, owned the outcome collectively, and were rewarded against project targets rather than functional ones.

The Integrated Master Schedule (IMS)

The IMS was the single source of truth for the program. It used a macro-micro architecture: the macro plan held about 10,000 tasks and the critical-path framework. Eight module-level micro schedules rolled up into it, eventually growing to over 100,000 tasks.

The IMS did four things at once. It was the organizational framework — the plan defined how the project was structured. It was the simulation engine: when things changed, and they changed constantly, the IMS modeled alternative paths and quantified their schedule impact. It was the early warning system, surfacing problems before they grew. And it was the interface manager, making cross-team dependencies visible and actively managed rather than discovered late.

Refresh Planning: the execution cadence

The Refresh Planning cadence sets the FTTM system apart from a conventional master-schedule discipline. The macro schedule was updated weekly with the full core team. The module-level micro schedules were refreshed twice daily, synchronized across 24/7 shifts. The cadence kept the schedule synchronized with ground truth, made gaps visible the same day they opened, and pushed decision-making authority down to the people closest to the work.

At a glance

The Fab 8 program

Figure 2. Program overview—challenge, solution, and results. The FTTM framework (empowered core team, Integrated Master Schedule, daily Refresh Planning) transformed a two-year projected delay into a two-week early delivery.

The visual sums up the program. On the left: a $7 billion budget, an industry-average 3–4 year timeline compressed to 2 years, $5 million per day cost of delay, and a stack of compounding crises (recession, customer changes, shifting technical requirements, labor issues). On the right: the FTTM apparatus and the two-week early delivery.

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Structure

Why this team outperforms

A conventional corporate team and the FTTM core team deployed on Fab 8 differ in kind, not degree. The comparison on the next page captures the structural dimensions where the FTTM model diverges from standard practice.

#	Dimension	Normal corporate team	Fab 8 FTTM core team
1	**Leadership**	Part-time coordinator, multiple projects, little power; control rests in functional hierarchy	Full-time Project Monarch with decision authority over technical and managerial scope
2	**Focus**	Independent work-streams focused on their own deliverables; leader manages interfaces alone	Integrated system; core team focused on integration points, working toward shared outcomes
3	**Dedication**	Part-time; members work on multiple projects	100% dedicated; the project is their only job
4	**Bias**	Function-bias; functional requirements always trump the project	Project-bias; focus on project outcomes (mission, not a job)
5	**Authority**	Representatives lack decision authority and technical expertise	Members have decision authority, speak for their function, are subject-matter experts
6	**Problem solving**	Time spent avoiding blame and covering for function failures	Forward-looking; learning cycles, incremental improvement; failures shared and used to learn
7	**Accountability**	Team does not own overall project outcomes; only functional deliverables	Team owns the outcome, accountable for success or failure, rewarded together
8	**Compensation**	Based on functional goals, not tied to project success	Based on project achieving targets in product performance and schedule
9	**Co-location**	Virtual or geographically distributed	Co-located; when not possible, regular in-person meetings monthly
10	**Identity**	Project is something people participate in; "real work" happens in function	Project operates like a small business where team members are equity owners

On Fab 8 these dimensions were structural choices, not aspirations. They were enforced from day one and maintained throughout the program. The team absorbed repeated process changes, supply chain disruptions, and labor crises without losing schedule momentum, because the operating model was built for instability.

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Results

Schedule, cost, and scope outcomes

The first qualified customer wafer came off the production line on December 27, 2011, two weeks ahead of the January 10, 2012 target. That recovered more than a year of projected schedule deficit. The team accelerated construction by three months, brought process qualification from Fab 1 in Germany in ahead of schedule on a very advanced silicon node, and synchronized that qualification with the Fab 8 start-up.

Schedule performance

The wigglechart below tracks the predicted finish date for First Silicon Starts over the life of the program. Each point on the X-axis is a refresh date; the Y-axis shows what the schedule predicted at that moment for first-silicon completion. The early spike toward late 2013 is the two-year deficit the initial macro plan exposed. The decline that follows is the gap closing — each plateau a step in the acceleration, each rise a setback the team absorbed and recovered from.

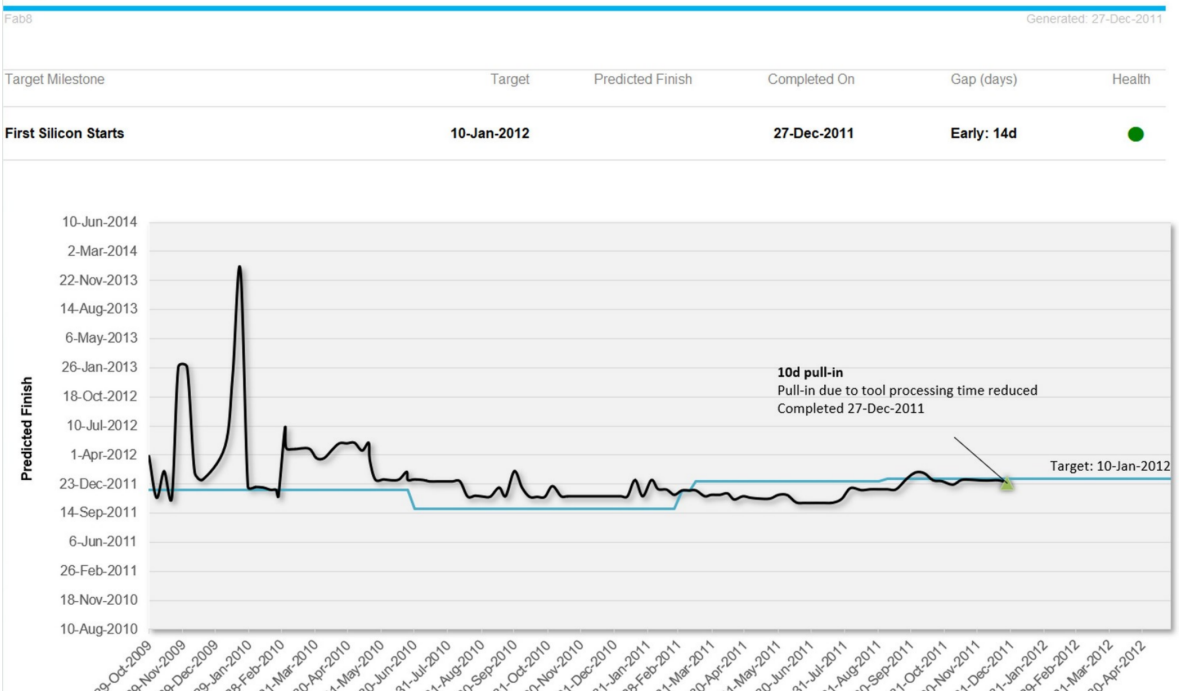

Figure 3. lateralworks wigglechart: First Silicon Starts milestone trend. Y-axis shows predicted finish date; X-axis shows refresh date. The initial spike toward late 2013 represents the ~2-year projected delay. Systematic acceleration pulled the schedule back to target. Final 10-day pull-in from reduced tool processing time delivered completion on December 27, 2011—14 days early.

Financial impact

By finishing 14 days ahead of schedule at a cost-of-delay rate of $5 million per day, Fab 8 avoided about $70 million in lost profit. Had the program continued on its initial trajectory, roughly two years late, the financial exposure would have exceeded $3 billion in delay costs alone.

Operational scope

The program delivered facility construction, procurement and installation of over 1,000 tools on the initial production line, process transfer and qualification from Germany, product qualification, and the staffing and training of 2,500 specialized employees. Fab 8 became the most advanced pure-play semiconductor foundry campus in the United States, with over 3,300 employees, 460,000 square feet of clean-room space, and 14nm and 7nm process capabilities.

Lasting influence

GlobalFoundries adopted the FTTM planning and acceleration system as the standard operating model for subsequent programs worldwide. The list includes: 20nm process development under the IBM Alliance Partnership, Fab 1 expansion planning and execution in Dresden, 28nm, 40nm, and 45nm process development FTTM teams, the Fab 9 master plan and start-up feasibility assessment for Abu Dhabi, 14nm process tool installations at Fab 8, and the Fab 11 start-up in Chengdu, China — which achieved the fastest worldwide fab start-up on record at 15 months from groundbreaking.

2 weeks	$70M	100,000+	>1 year
Ahead of target	Delay costs avoided	Scheduled tasks	Schedule recovered

Outcome. A project tracking two years late delivered two weeks early — converting a potential $3B+ exposure into $70M in savings — through structural intervention rather than heroics. The system worked because it was built for instability.

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lateralworks role

Six interconnected functions

lateralworks served as the program’s external planning and acceleration partner across the two-year engagement, applying the FTTM framework from a third-party perspective. The role broke into six functions.

Structured complexity. Decomposed a program of unusual scope into a workable planning structure. The macro plan fed eight module-level micro schedules, and the architecture scaled from 5 core members to 15 sub-core-teams without losing coherence.

Developed the plan. Programmed the initial end-to-end macro plan, organized the work breakdown structure, pulled estimates together across all workstreams, and integrated dependencies across module boundaries. The plan was the program's operating system.

Facilitated. Engaged every stakeholder — GlobalFoundries team, suppliers, contractors — to reach consensus on schedule commitments, resource allocation, and acceleration opportunities.

Permitted truth to surface. Used the IMS to identify gaps with precision and transparency. The initial plan's two-year deficit was the plan doing its job, surfacing the problem early enough to act on it. The system made problems visible before they became crises.

Created urgency. A clear problem definition, grounded in quantified schedule gaps, creates urgency that is specific and actionable. The weekly scorecard told every team where they stood and what needed to change.

Accelerated. Drove schedule accelerations continuously. Established weekly Refresh Planning at the macro level and twice-daily Refresh at the module level, coached the executive team, trained a large internal program-management team, and built a project planning and acceleration system that GlobalFoundries continues to use on later programs.

Special expertise. lateralworks brings particular depth in managing what is hardest to plan: bleeding-edge technology innovation, where requirements shift, processes are unproven, and the schedule is the mechanism that forces uncertainty into the open early.

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Takeaways

The reusable pattern

The Fab 8 program demonstrates principles that apply to any complex, time-critical program — semiconductor manufacturing, advanced technology development, large-scale construction, or any other domain where schedule compression and technical uncertainty meet organizational complexity.

Reveal the gap early. The first act of planning is to show the truth. The macro plan on Fab 8 revealed a two-year deficit, and that transparency was the precondition for every acceleration that followed. Programs that avoid confronting their real schedule position lose the time they need to recover.

Design the operating model for instability. Fab 8's requirements changed twice in the first eight months. The FTTM framework worked because it was built for instability from the outset. The IMS simulation capability, the high-frequency refresh cadence, and the empowered core team all assumed change.

Empower a single leader with end-to-end ownership. The Project Monarch model cuts out the committee-driven compromise that slows decisions in matrix organizations. One person owns the outcome across all functions, protects the team from organizational noise, and makes tradeoffs at the speed the schedule demands.

Keep the core team small and senior. Fifteen subject-matter experts, each 100% dedicated and each empowered to make real decisions, outperformed what a larger, part-time, hierarchically constrained team could have achieved. Small teams communicate at high bandwidth, which matters when the ground keeps shifting.

Use the schedule as a management system, not a reporting tool. The IMS was the organizational framework, the simulation engine, the early warning system, and the interface manager, all in one artifact. When something changed, the schedule modeled alternatives and created urgency before the problem became a crisis.

Run Refresh Planning at the cadence the program demands. Weekly macro updates and twice-daily micro refreshes across 24/7 shifts kept the schedule synchronized with ground truth and pushed decision authority to the people closest to the work.

Integrate suppliers and partners as one team. Partners and key suppliers on Fab 8 sat inside the core team structure, shared the IMS, and ran on the refresh planning cadence. One team, one project, one schedule.

The pattern is reusable. Empowered governance, cross-functional ownership, an integrated schedule system, and a high-frequency planning cadence beat siloed execution every time. Fab 8 proved it under conditions designed to make it fail.

Detailed view

Challenge, solution, and outcome

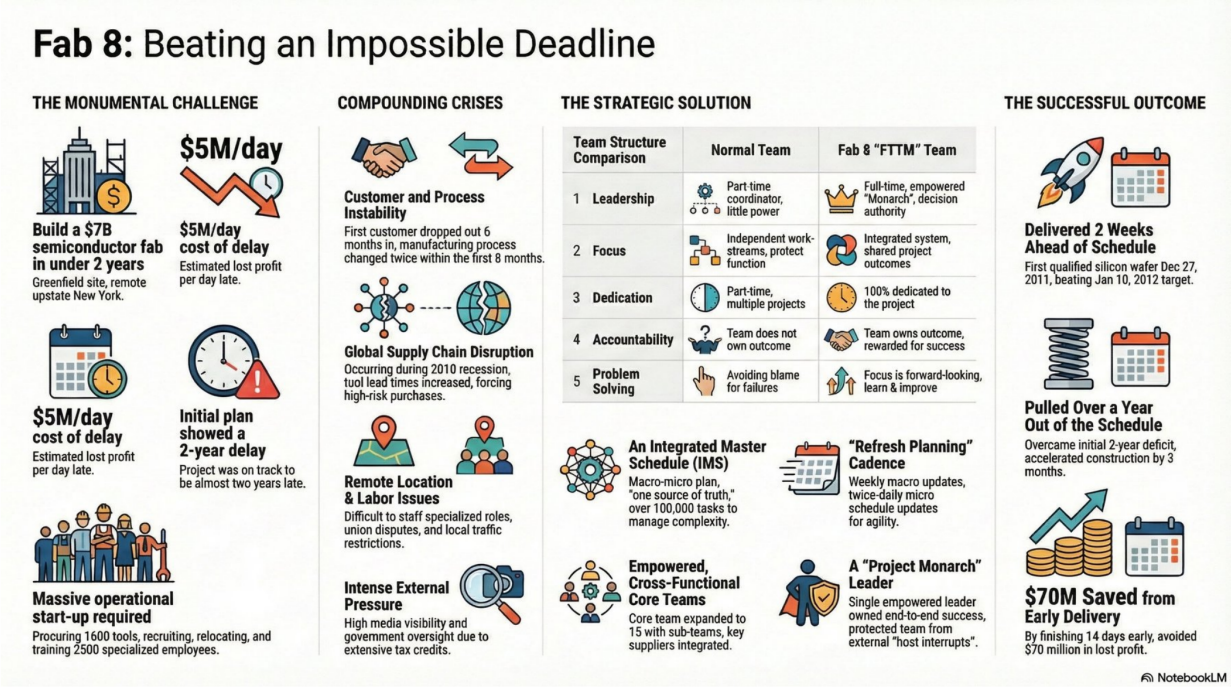

Figure 4. Detailed program summary—the monumental challenge, compounding crises, strategic solution (FTTM team structure comparison), and successful outcome.

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Engagement

Summary of the program

The table on the next page records the program at a glance: the parties, the duration, the problem, the solution architecture, the lateralworks role, and the outcomes. Use it as a quick-reference summary.

Attribute	Detail
Project	Fab 8 (Malta, NY)
Client	GlobalFoundries
Type	Fab start-up
Duration	2 years (2009–2011)
Problem	Deliver a greenfield mega semiconductor fab in under 2 years to meet customer demand. $5M/day cost of delay. A major customer expecting initial capacity of advanced process technology. $7B program for newly formed GlobalFoundries after the AMD acquisition.
Solution	Integrated cross-functional planning system involving team and structure to implement FTTM best practices: schedule acceleration, transparency, early warning, and trend analysis. Involved not just the GlobalFoundries team but every supplier. Macro-micro schedule system with over 125,000 tasks, 8 major modules, and twice-daily refreshes.
lateralworks role	Programmed the initial macro plan (end-to-end), established the core team, established weekly Refresh Planning, drove schedule accelerations, developed and implemented macro and micro integrated plans, established twice-daily Refresh of module micro schedules, coached the executive team, trained a large internal program management team, and established a project planning and acceleration system used continuously on future programs (fab expansion and advanced process node development).
Outcomes	First silicon produced from initial >1,000 tool line 2 weeks ahead of schedule. $70M in savings due to early delivery. The program involved facility construction, tool procurement, installation and qualification, process transfer and product qualification, including initial 2,500-person fab staffing and operations start-up.

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