

Public Private Partnerships – a Trend or a Thing of the Past?

By Kevin Wills, CCM, LEED AP and Charles Bolyard, Jr., PSP, CFCC

Public Private Partnerships, also referred to as PPPs or P3s, have been in use for many decades after first gaining wide acceptance in the United States in the early 1990's. These partnerships were established through state legislative actions as an alternative method to finance public capital improvement projects during times when public debt was increasing rapidly. Primarily for use in transportation, infrastructure, and educational facility programs and projects, PPPs offer a vehicle for state and local government agencies to obtain needed infrastructure for the public good without leveraging their bond ratings or taking on increased fiscal risk. The processes and procedures for these partnerships are specific to each jurisdiction that has enacted legislation enabling the use of PPPs. While

similarities exist from jurisdiction to jurisdiction, legislation often contains provisions specific

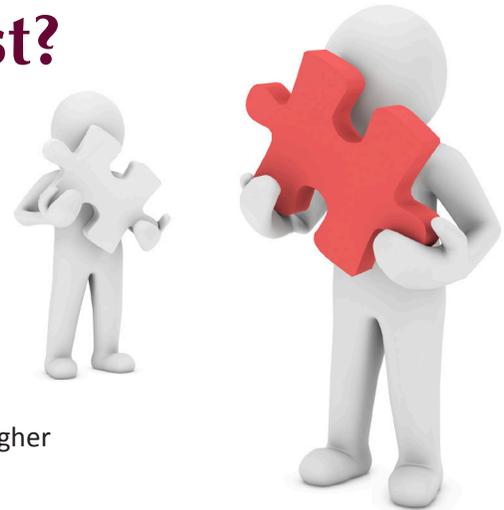
to each public Owner. While the Commonwealth of Virginia has been at the forefront in the application of PPPs in the United States, this approach

to project development and construction has been applied internationally to leverage private resources to fund and build a comprehensive range of projects, including transportation infrastructure, environmental, higher education and research facilities, K-12 schools, municipal facilities, wastewater treatment plants, and telecommunications infrastructure - essentially any type of public project.

This process, once authorized by legislation and adopted by public agencies, municipalities, counties, or cities, is a relatively simple one that complies with the transparency required of public sector procurements, but also increases the opportunity for the public Owner to receive the best possible goods from the marketplace

to serve the public's needs at the best value. In simple terms, PPPs typically involve a proposal (which may be solicited

or unsolicited depending upon what each governmental agency's legislation allows) from a private vendor to design, construct and provide some form of



financing for a project that serves the public good, and would typically otherwise be financed and constructed by a public Owner through more traditional procurement processes. In some circumstances, PPPs may include an alternative approach that involves governmental agencies transferring public assets to private concessionaires to operate in the public interest (such as existing toll roads that have been transitioned in Virginia, Indiana and other locations). Most important to the PPP process is the review, negotiation, and the development of financing, design and construction parameters that establish the business arrangement between the vendor/developer/design builder and Owner prior to entering into a contract based on the PPP procurement process.

In a traditional public project procurement, utilizing the design-bid-build, design-build method of project

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delivery, the Owner would hire a designer to develop 100% drawings, plans, and specifications, then arrange public funding sources, and once approved for procurement, would publicly advertise the project for bidding or receipt of proposals from general contractors. The resulting lowest responsive bidder would then be responsible for constructing the project. Change order costs in the more traditional type of project delivery are largely the responsibility of the Owner, as are the costs for designer errors and omissions.

The PPP process, on the other hand, encourages the allocation of risk and reaches into the marketplace to bring the innovative thinking and vision from the private sector to public projects. PPPs provide the opportunity for the Owner and the project developer to act in concert, as a team, and use all available expertise, specialization, knowledge and financing options as a team to the benefit of the project and in the greater interest of the public. The PPP vendor, selected following evaluation of proposals received by the Owner, will work in concert with the Owner to achieve expectations and address the public need, while providing the Owner the level of confidence in successful completion of the program or project. Many times, through the PPP process, the Owner is able

to leverage more of the potential for enhancing a project than would have otherwise been achievable if it had been a project procured under a more traditional procurement method. PPPs combine talents across the public and private sectors and bring those talents and innovations to the table to achieve the greatest benefit to the public.

The PPP process can also speed the time for completion of the project as the expediciencies inherent in the delivery process eliminate the traditional need for extensive review by local, state or federal agencies once the parameters for the project are established.

More traditional contracts for design and construction are an Owner's way of dispersing risk and PPPs are no exception. Depending upon the Owner's risk management profile, a PPP can be an integral component of an Owner's risk management program. Allocation of risk is an important consideration since there is a cost to transfer risk from the Owner to the vendor. In the customary design-bid-build project delivery vehicle, the Owner holds contracts with both the designer(s) and general contractor(s), and takes responsibility and the risk for unforeseen costs that may be encountered. In a PPP procurement the Owner holds one contract with the PPP team. The PPP team holds the responsibility for design costs and issues and may also hold responsibility for site conditions, integration with utilities, and interface with public agencies other than the

Owner, which are elements of the agreement with the Owner and included in the contract price. Opportunities for funding of the project through tolls, tax financing, lease agreements, and numerous other options are additional ways through which the Owner is able to reduce its risk profile related to a project, as these options may be more readily available under a PPP project delivery

as compared to more traditional project delivery approaches. Essential projects that would be deferred by the Owner due to a lack of available funding are able to proceed under the PPP approach when project funding is a component of the vendor's scope. PPPs are increasingly showing that the more traditional project delivery methods based on low bid contracting do not always result in the lowest completed project cost. PPP project costs have been found to be lower, or at least comparable to traditional delivery approaches in overall costs, if the characteristics of the project are compatible with the use of a PPP based procurement.

Based on the breadth of our experience with state and local jurisdictional agencies that have enacted varying forms of PPP legislation, MBP has a longstanding history of assisting project Owners throughout the PPP process. Our firm provides Owners with an expert review and analysis of PPP proposals including cost, schedule, scope, compatibility with requirements and legislation, and constructibility review in support of the Owner's evaluation of proposals and during negotiations to conclude the procurement process. We also provide comprehensive program or project agency construction management

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and commissioning services to further assist an Owner during the actual design, construction and project close-out phases of a project. As the agent of the Owner, MBP offers the Owner a higher level independent scrutiny during procurement and performance by the PPP, further enhancing the results of the Owner's risk management program.

For PPP teams, MBP provides assistance during the proposal development and procurement process. During actual design and construction performance, we can provide quality control and assurance program development, implementation

of quality assurance inspections, risk management, and expert scheduling services.

In the political, financial, and economic climate of today, Owners are quickly seeing the benefits in the application of the Public Private Partnership delivery approach for programs and projects. The need, both nationally and internationally, to upgrade and replace current infrastructure under tremendous budgetary limitations has led to this innovative delivery method being utilized more frequently than before. As public revenue streams have diminished, the collaboration of the private and public sectors is being

recognized as a cost competitive, quick-to-the-marketplace process that is often superior to the traditional methods of project delivery. States across the nation, as well as the federal government, have instituted PPPs as a viable and preferred method to obtain high quality and innovative projects and we expect that this trend will continue for many years to come. **MBP**

Kevin Wills is Senior Project Manager and Charles Bolyard is Chairman/CEO, both with MBP. They can be reached at kwills@mbpce.com or cbolyard@mbpce.com, respectively.

New Team Members

ATLANTA, GA

Josh E. Rowan, PE, PgMP, PMP, CCM joined MBP as Branch Manager. He brings more than 18 years' experience on a wide array of local and international infrastructure projects. Josh has a Bachelor's degree in Natural Sciences from Covenant College and a Bachelor's degree in Civil Engineering from the Georgia Institute of Technology and is a licensed professional engineer in Georgia and Alabama.

NEW YORK, NY

James (Mike) Bradbury, PE joined the team as Senior Project Manager. Mike has more than 25 years' experience providing construction engineering, logistics, operations, and maintenance for heavy civil works projects. He holds a Bachelor's in Applied Science and Engineering from the United States Military Academy at West Point and Masters' degrees in Structural Engineering and Geotechnical Engineering, both from Stanford University. He is a licensed professional engineer in Virginia.

Edward Moore, PE joined our New York team as Commissioning Project Manager. With more than 28 years' experience in project management, commissioning, retro-commissioning, and energy audit of power projects, his knowledge and leadership extends to writing specifications, conducting bid processes, and providing contract

management for various energy-focused mechanical and controls projects. He has a Bachelor's degree in Engineering from the State University of New York, Maritime College and is a licensed professional engineer in New York and Connecticut.

FAIRFAX, VA

Gregory A. Collier, PS joined our Fairfax team as Senior Consultant. He has more than 31 years of experience in construction administration, project management, project controls, highway plan development, and right-of-way acquisition. He has two Associates degrees in Civil Engineering and Engineering Design, both from Edison State Community College, and is proficient in the use of Primavera CPM scheduling software for project scheduling, delay analysis, and claims reviews.

RICHMOND, VA

William Curry, CEM, Senior Commissioning Agent, has more than 20 years' experience in providing commissioning and retro-commissioning services to both new and existing buildings. He has also managed the design of new engineering projects such as steam lines or HVAC systems, along with other maintenance replacement projects. He attended Virginia Commonwealth University and is certified by the Association of Energy Engineers as a Certified Energy Manager.

New Team Members *Continued...*

CHESAPEAKE, VA

Ronnie Rouse, PE joined MBP as a Project Manager. He has more than 30 years of construction management experience to include project management, scheduling, cost estimating, and field supervision for government, industrial, educational,

commercial, residential, healthcare, and transportation projects. He has a Bachelor's degree in Civil Engineering from Virginia Tech, a Master's degree in Structural Engineering from Old Dominion University, and is a licensed professional engineer in Virginia and North Carolina.

New Projects

Washington, DC

1000 F Street Office Building, Washington, DC: MBP is providing existing condition documentation services prior to construction commencing.

Virginia

National Sporting Library and Museum, Arlington, VA: MBP is providing retro-commissioning services following a major renovation of the existing library and museum.

Waxpool Road, Loudoun County, VA: MBP is providing inspection services on behalf of Loudoun County for this \$2.3 million project. Services include full time on-site project inspection and coordination between the contractor and materials testing firm as well as with Loudoun County.

Hanover County Courthouse, Hanover, VA: The firm is providing owner's representative services to include constructibility reviews at the 95% stage, procurement phase services, construction management services, schedule review, commissioning, and building envelope commissioning services for the new \$44 million courthouse.

Albemarle County Local Assistance Program (LAP), Albemarle County, VA: MBP provided cost estimating and scheduling for the construction of new sidewalks and pedestrian improvements located in Albemarle County.

VDOT Finals Contract 3, VA: MBP is reviewing final project audit documents, resolving discrepancies, preparing as-built drawings in CAD, and reporting to

VDOT on overall status of the project records. The projects include road and bridge work in the State of Virginia.

King and Beaugard Intersection Improvements, Alexandria, VA: MBP is providing constructibility review services in support of the project documents, and recommendations for design or document modifications prior to bidding.

Route 35 Darden Bridge Replacement, Southampton County, VA: MBP is providing inspection and documentation services for the \$9.4 million bridge replacement project.

Black History Museum, Richmond, VA: MBP is providing services to the lender who is financing the renovation of the Leigh Street Armory Building and the construction of a new Black History Museum for this \$12 million project.

Old Dominion University, Norfolk, VA: MBP is providing construction management services for various projects on the Old Dominion campus.

Roanoke-Blacksburg Regional Airport, Roanoke, VA: MBP is providing project management and field inspection services for improvements to accessibility on the exterior of the Main Terminal Building.

Colorado

National Park Service, Denver Service Center, Lakeland, CO: MBP is providing construction management services in support of the project delivery team for various projects throughout the U.S.

Maryland

Colonial Pipeline Company, Woodbine, MD: MBP is providing commissioning

services for construction of two new prefabricated buildings to include a pump house and an equipment storage building.

North Carolina

Eastern Area Health Education Center, Greenville, NC: MBP is providing cost estimating services for the \$5.5 million teaching facility.

Jefferson Standard Building, Greensboro, NC: MBP is providing cost estimating, constructibility review and commissioning services for the \$50 million interior renovation of this 18-story building constructed in 1922 and currently on the National Register of Historic Places.

Raleigh Union Station, Raleigh, NC: The firm is providing enhanced commissioning services on behalf of the City of Raleigh during the design, construction, acceptance, and occupancy phases of the project.

Duke Health and Wellness Center, Durham, NC: MBP managed the commissioning process on behalf of Duke University during the design, construction, acceptance and occupancy phases of the project.

911 Emergency Operations Call Center, Hertford County, NC: The firm is providing cost estimating services at the design, development and construction document phases of the project.

International

NAVFAC Far East, Japan: The firm is providing construction management and surveillance services for various construction projects in Yokosuka, Atsugi, and Okinawa, Japan.



The Art of Fortune Telling: Is Your Schedule Update Telling You What You Think It Is?

By Christopher J. Payne, PE, CCM

Consider the following scenario. You are managing a project on behalf of an owner.

The project contract requires that the contractor prepare a detailed CPM schedule which includes cost-loading, and then submit monthly updates with updated costs and projections of work to be completed. Like any good construction manager, you perform a detailed review of that baseline schedule and its subsequent updates.

Early on in the project, you notice that the contractor's performance is lagging behind the baseline schedule you've reviewed and approved.

However, the contractor recognizes that its performance has not met the goals set forth in the baseline schedule and makes revisions showing how the project will stay on schedule as part of the updating process. This pattern repeats itself for several months, with each successive update revised slightly to show that the project will finish on time, even though actual progress is well behind what was originally envisioned.

While you are encouraged that the contractor continues to take responsibility for the initial delays and report that the project will finish on time, you are now in a dilemma: you start to suspect that the current forecast contained in the schedule cannot be performed, given the resources and production of the contractor. The monthly schedule submittal continues to indicate that everything is fine—the critical path is reasonable, the remaining work is aggressive but achievable—but your experience tells you that the schedule is not realistic. What do you do? Should you report to ownership that the project will finish late? Reject the contractor's schedule update?

What should construction managers and owners do about this all-too-real dilemma? Through an analysis of more than 120 actual projects, MBP has identified some common indicators that can help you avoid some of the delusions that construction managers typically possess when reviewing cost-loaded CPM schedules.

COST-LOADED CPM SCHEDULES

For more than 50 years, it has been well recognized in the construction industry that a well-developed critical path method (CPM) schedule is the best tool for managing time on a project. Over the past 20 years, cost-loaded CPM schedules have become increasingly accepted as a convenient tool for determining progress payments and assessing project performance. Typically, an initial or baseline schedule is established at the outset of the project, which includes the assignment of values for each line item in the schedule. This schedule is then updated on a monthly basis to assess contractor progress, establish the basis for monthly progress payments, and to forecast the project completion date based on current progress and any revisions to the schedule that reflect the contractor's current plan for performance.

Too often, however, projects finish late in spite of the existence of such schedules. In many such cases, schedule updates seem to indicate that the project is on schedule or just a week or two behind, even when the project in fact ultimately finishes many months behind schedule.

OUR RESEARCH

Using data from more than 120 projects and more than 2,400 schedule updates, MBP conducted detailed research to see if there were early warning signs that might indicate when projects might be in trouble in spite of favorable schedule updates projecting an on-time completion. We collected cost-loaded schedules from various project types, including horizontal and vertical construction, using various delivery methods, primarily design-bid-build and design-build. We compiled the schedules into a database in order to examine whether there were trends amongst the various projects that were consistent.

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The Art of Fortune Telling: Is Your Schedule Update Telling You What You Think It Is? *Continued...*

Our research supports the following notions:

- Projects frequently finish late.
- Owners and construction managers frequently misinterpret schedules provided to them.
- Increased use of earned value methodologies can reduce the misinterpretations and lead to better outcomes.

COMMON SCHEDULE ANALYSIS TECHNIQUES

On projects with cost-loaded CPM schedules, most sophisticated owners and construction managers have procedures in place to review contractor schedule submittals. Commonly used basic techniques include checking for the following items in addition to numerous others:

- Basic schedule quality, including the use of correct relationships among activities, reasonable durations of work, supportable assignment of costs, and overall coherent organization of activities.
- A reasonable critical path that indicates that progress on the project will be controlled by major operations that are planned to be performed in a logical sequence.
- The absence of negative float, which would indicate that an initial schedule or update indicates an anticipated finish beyond the contract completion date.

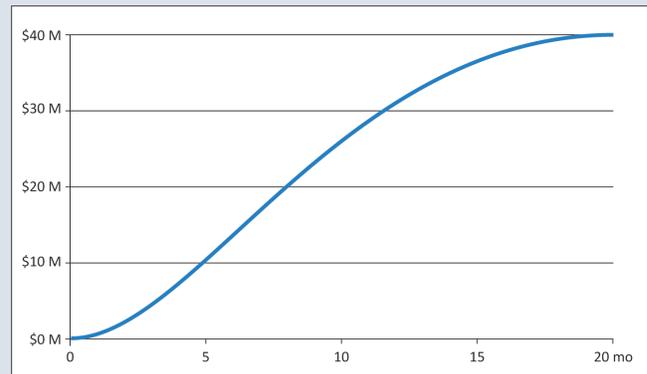
With cost-loaded schedules, our research suggests that these traditional techniques are inadequate and should be enhanced with additional analysis typically associated with earned value analysis.

EARNED VALUE CONCEPT: THE S-CURVE

While true earned value analysis is complex, the basic element that can be considered is the S-curve, or earnings curve, a plot of cumulative cost versus time derived from the CPM schedule (planned or actual). The curve derives its name from an idealized shape, where progress would typically start slowly, build momentum during the middle of the project, then taper off near completion, thus producing an S-shaped curve.

Since CPM schedule activities intrinsically possess float, indicating a range of time in which the various events can occur, it is possible to plot S-curves using early dates (the most optimistic projection of planned activity) and late dates (the most pessimistic). Too often, these curves are overlooked in schedule analysis but provide a rich source of data.

Figure 1: A typical S-curve



OUR PROCESS

In our research, we converted all costs and durations from the various projects to percentage values to allow for a side-by-side comparison. For example, on a typical project, one might expect that approximately 50% of the cost of the work would be earned after 50% of the time has elapsed, regardless of whether it was a \$2 million project to be completed in nine months or a \$100 million project spanning two years.

Our strategy was to determine whether there were certain characteristics of successful projects finishing on time that would be identifiable as compared to those that finished late. Our hope was that in comparing hundreds of schedules, we might identify key warning signs of projects going off track.

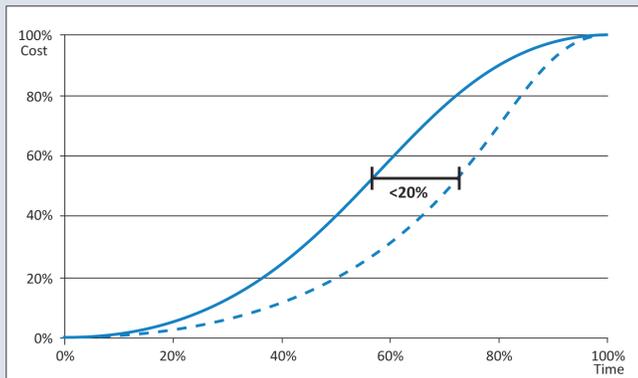
KEY FINDINGS

We found that better developed schedules tend to correlate with better project outcomes. For example, one indicator for likely success in a project comes from comparing the early and late earnings curves in the planned schedule.

Our research indicates that in schedules where there is a wide gap between the early and late curves, the project is more likely to finish late. The appearance of early and late curves too far apart can be an indication of an incompletely developed and/or overly aggressive schedule. If the project starts off slowly, the apparent flexibility in the remaining schedule may mask serious performance issues that wouldn't readily be detected through typical analysis techniques. Our research suggests that the curves should be no more than 20% of the time duration apart at their widest gap.

The appearance of early and late curves too far apart can be an indication of an incompletely developed and/or overly aggressive schedule."

Figure 2: Recommended gap in early and late curves



A related flaw in many schedules we reviewed was overly steep earnings curves, such as those indicating that a large portion of the work would be performed in a very short period of time. For example, we saw a tendency in the earnings curves of projects that finished late with very aggressive performance of 40 -50 percent of the work in just 10-15 percent of the time allowed on the project. On most projects, it is simply unrealistic for production to ramp up into such a frenzy of activity during a limited time period. When this anticipated frenzied period of activity was scheduled late in a project, the “S-curve” more closely resembled a “J-curve”, and almost inevitably proved unsustainable. Our research indicates that the maximum slope of an earnings curve (% of cost over a % of time) should not generally exceed three.

CONCLUSION

As illustrated in the scenario at the opening of this article, the disparity between the typical CPM data of dates, durations, and floats versus the projected earnings data can widen over the life of a delayed project. Therefore, it is important that a thorough initial schedule review, incorporating earned value analysis, be done when approving a baseline schedule to verify that the initial schedule presents a sound basis for evaluation. During project performance, these analyses should be repeated to make sure that early warning signs of pending delays are not overlooked. A proactive and robust schedule and cost analysis can be the best way to avoid the delusions that can arise from typical schedule reviews. **MBP**

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Other News

MBP Attending the CMAA National Conference in San Francisco

MBP will be presenting and exhibiting at CMAA’s National Conference October 19-21 at the Marriott Marquis in San Francisco. We hope to see you there!

MBP Named Best Firm to Work For

MBP placed 7th in the Multidiscipline category and 30th overall in the Top 100 of all firms for the Best Firms to Work For, an award program sponsored by ZweigWhite which recognizes the top firms leading the way in creating a work place that inspires, motivates, and rewards employees. We are very proud of this accomplishment.



MBP Received Honorable Mention from Virginia Transportation Construction Alliance

MBP received Honorable Mention in Projects Greater Than \$10 Million, VDOT category in collaboration with Amman & Whitney Consulting Engineers for the Huguenot Memorial Bridge Replacement. The Virginia Transportation Construction Alliance recognizes the top firms with their annual Transportation Engineer Awards.

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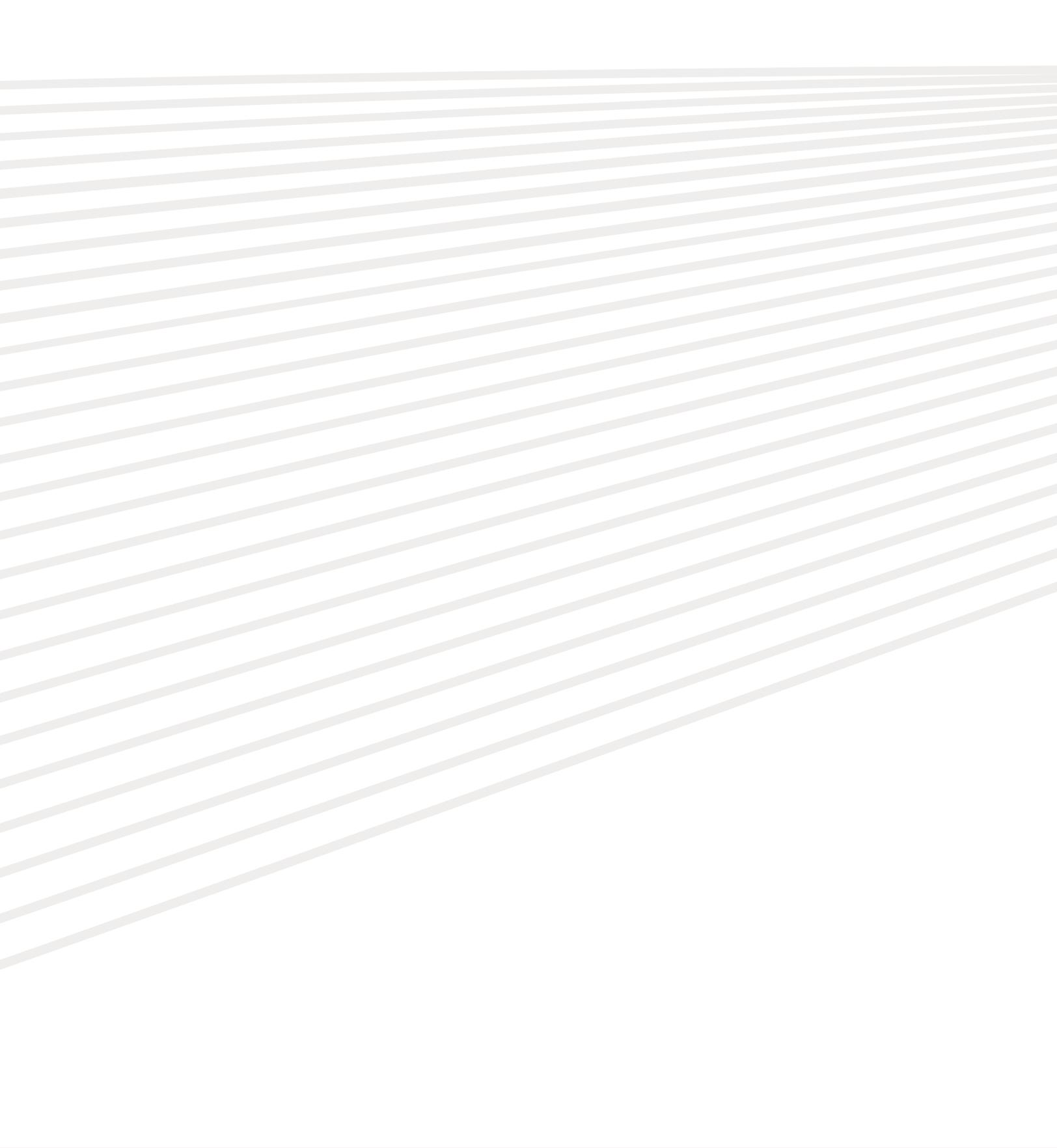
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