Overview

As the nation's second-largest public transportation system the Chicago Transit Authority (CTA) operates an expansive fleet of vehicles and a plethora of related assets to deliver integrated transit services. This includes 1,868 buses, 127 routes, 10,633 bus stops, and 15,943 trips per day. The rapid transit services consists of 1,480 rail cars, 8 routes, 145 stations, and 1,888 trips per day. The geographic footprint for these operations spans all 77 community areas located within the City of Chicago, as well as 35 surrounding suburbs.

Accordingly, the CTA requires a robust and high-functioning transit scheduling system for bus and rail daily operations with the most up-to-date optimization tools. Such a scheduling system supports not only CTA's daily bus and rail service but interfaces with numerous other systems including daily operation and dispatch payroll, and trip planning functions.

The CTA Scheduling department is responsible for producing vehicle schedules, bus and rail operator (crew) schedules, and generating interfaces for the TOPS Trapeze system and other critical data systems. A robust software tool is needed to produce efficient and reliable schedules within budget constraints. The crew schedules must also comply with Collective Bargaining Agreement rules and assist in modeling new work rules.

A scheduling software tool is needed to optimize the daily schedules for over 4,000 bus operators who provide over 15,000 bus trips per weekday. On the rail side of the business, daily schedules are created for over 1,300 rail operating personnel in five different classifications. The rail scheduling software must also incorporate CTA infrastructure constraints, including rail junctions, rail terminal and yard capacity. The volume and complexity of the CTA service requirements along with construction activities at CTA requires leading-edge information technology, strong maintenance support and a vendor committed to research and development of latest transit scheduling optimization tools.

The current scheduling software platform used by CTA is HASTUS version 2017, a product from GIRO, Inc. based in Montreal, Canada. The HASTUS system has been used in the day-to-day operations by the CTA Planning department for the development and maintenance of bus and rail operations schedules since 2001. CTA has made significant investment in customizations for meet their unique scheduling practices and Collective Bargaining Agreements for bus and rail infrastructure.

This vendor recommends an upgrade every five to six years in order to take advantage of system enhancements and optimization improvements. Up to 30% of GIRO employees are engaged in research & development work and their scheduling technology is considered best-in-class. CTA currently operates version 2017 of HASTUS and is in the process of upgrading to version 2024, by March 2025. This upgrade is part of the current contract that expires 02/28/2026. CTA anticipates that another upgrade will be required after March 2030 under the contract renewal for maintenance and support services that will span 03/01/2026 - 02/28/2031. A Gap Analysis will be conducted after January 2030 to accurately gauge the Scope of Services required to complete the new upgrade. The related procurement will be via a Task Order.

A. ***System Features***

- **Vehicle scheduling software. The system must:**
  - The ability to build and modify bus and rail trips, including undo/redo features.
  - The ability to shift trips to different vehicle blocks.
  - Allow for graphical display of vehicle schedules and a vehicle accumulation feature.
  - Provides the capacity to enter and change route variants, time points, bus stop names and locations.
  - Provides the capacity and flexibility to insert deadhead times and update deadhead mileage.
  - The ability to set minimal layovers for vehicles by minutes or % of end-to-end run time.
  - The ability to store multiple vehicle schedule scenarios.
  - The functionality to couple and uncouple trains to adjust car lengths for rail scheduling.
- **Crew scheduling. The system must:**
  - Provide a robust platform for creating crew assignments pertaining for bus and rail personnel.
  - Allows efficient crew duties to be developed to cover vehicle blocks.
  - Provides automatic and interactive procedures to be able to cut vehicle blocks and combine pieces of work into valid duties.
  - Allow the ability to view two run-cutting solutions on a single screen.
  - Allow for automated methods to generate crew travel times for making reliefs.
  - Allows for crew assignment detail and display to be organized at the platform time, work time and pay time level.
  - Is programmed with rules that reflect CTA Collective Bargaining Agreements for bus and rail operators.
  - Allows soft rules to be modified to meet preferences of bus and rail operations.
  - Allow for expansion of new work locations and duty types.

- **Vehicle and Crew optimization modules. The system must:**
  - Produce automated solutions to minimize labor costs and fleet requirements while respecting CTA scheduling practices.
  - Include vehicle optimization tools to create vehicle blocks that minimize the number of vehicles used and minimize unproductive time.
  - Deploy best-in-class technology for crew and vehicle scenario with the ability to modify or add new attributes for run cutting purposes.
  - Allow both crew and vehicle schedules to be viewed side-by-side.
  - Allow for multiple scenarios to be run simultaneously.

- **Rostering. The system must:**
  - Help prepare efficient weekly schedules for bus and rail operators.
  - Provide a scheduling tool for organizing work on a weekly basis.
  - Display relevant elements - duty numbers, work time and pay time by roster position.
  - Optimize weekly work using rule sets relating to efficiency, weekly hour caps, Collective Bargaining Agreement requirements, and day off requirements.

- **Run time analysis. The system must:**
  - Provide a run time analysis tool for both bus and rail based on allocation of travel time between timing points.
  - Provides for the ability to automatically import actual run time data to compare to scheduled run time.
  - Allows run time adjustments to be made based on percentages of actual run time.
  - Accommodate run time changes for 24-hour bus routes and rail lines.

- **Rider measurement. The system must:**
  - Import vehicle run times and ridership measurements from both bus and rail data.
  - Generate service planning options based on this data.
  - Allow for service planning options to be imported back into the scheduling platform.

- **Report and interface requirements. The system must:**
  - Includes a summary report for peak fleet/vehicle requirements by location, day types and vehicle types or any other relevant attributes in the system.
  - Includes a summary report for manpower assignments based on location, day types and work and duty types.
  - The capability to generate lists and data summaries of schedule data.
  - The ability to conduct a database export or partial export.
  - The ability to run standard set of operator run paddles and supervisor guides for both bus and rail operations.
  - The ability to compress and store archival historical schedules.
  - The ability to generate timetables for bus and rail.
  - The ability to generate interfaces to other critical data systems identified by CTA.

- **System architecture. The system must:**
  - Provide for testing and deployment of new Hastus applications.
  - Allow for the easy creation of test and development instances.
  - Accommodate the download of an entire schedule database for transmission to the vendor for analysis purposes.

- **System functionality. The system must:**
  - Modify the upgraded software to include all previous customizations and change requests in current version of the software, unless specified by CTA.
  - Include modules: Vehicle, Crew, Crew Opt, Min Bus, MinRail, Roster, HASTOP, ATP and Rider
  - Offer functionality and features within the above modules which is equal to or enhanced to the current system software vendor
  - Include all the interfaces currently generated via Hastus 2024, unless noted by CTA.

B. ***Maintenance Support Services***

Maintenance and support services for Giro Hastus applications are required during the agency's regular business hours 08:00-16:30 (Central Time). During these hours, access to help desk resources is a must. It is especially helpful to CTA Scheduling users who ensure technical expertise in response to their inquires. This contact will be via e-mail and or phone.

The vendor must offer a maintenance and support contract. CTA is open to a two-tiered approach where a baseline service: a) provides technical support, trouble-shooting and analysis for **day-to-day** use of the system and b) corrects defects in the software.

For enhancements, training, and ad hoc support**,** CTA prefers an agreement where the agency can draw from a bank-of- hours purchased in advance. In regard to contract detail, CTA is also open to an arrangement in which a multi-year maintenance support contract is purchased and the upgrade is priced in the future following a gap analysis and procured via a Task Order.

APPENDIX A
Example of Types of Enhancements, Customizations, and Task Orders

Listed below are examples of the types of enhancements and customizations that may require the use of Giro experts. The actual request may vary based upon the needs of the business.	
Public Timetable interface (Specs 5.9.2)	Public Timetable interface enhancement: - For Bus and Rail: Include the headway in the **interface.** - For Rail: Generate the interface for all places, not only timing points. Attributes "Trp start headway" and "Trp end headway" can be added via configuration. CTA to confirm if this meets the requirement. To generate the interface for all places, all places including those that are not timing points must be listed in the place pattern.
Roster report (Specs 5.9.6, 5.9.6.1, 5.9.6.2)	Roster report: Terminology adjustment to the title The following customization will be made: - Add the option to change the report title to "Work week report
Bus Supervisor Guide (Specs 5.10.1.1)	The report to be based on the customized Headway Report. The aim is to increase the font size to 10 pts and **use all rows on the page, down to a one-row** buffer at the bottom of the page. Shade every other line. A line can be multiple if OX Final design will be determined in the Specifications phase. The following adjustments are under **consideration:** Merge the "From Garage" and the "Leave place" columns. Merge the "To Garage" and the "To Place" columns. Transfer the DH note for fall back (Deadhead to intermediate place) to a timing point note on the last TP of the preceding trip. **Eliminate the [11]To Gar[11] and //From Gar[11] columns.**
Rail Supervisor Guide (Specs 5.10.1.2)	Crystal Reports adjustments as follows. Adjust the direction of the relief before the duty that covers the trip. Requires a UD field for Clockwise and Counterclockwise route. Display the timing point note after the timing

	point passing time. Shrink the text note box to minimum size. Added Reliefs to be underlined instead of having the "carrot" symbol, and add the relief note description in the note box. When a trip does not operate every day of the week, add the text "Trip operates on <operating days>". This text will appear after or before the trip's passing times if there is sufficient space. If not, then it will be printed on a second line. Crew-in not always printed correctly (bug covered by the maintenance contract). Crew Next Leave not always printed correctly (bug covered by the maintenance contract).
Run Paddle (Specs 5.10.3)	Keep Leader/Follower: Maintain Leader/Follower calculation. For 2-piece part-time duties, second reporting time *(SignOn)* to be printed in the header. This requires a line addition in the left-hand side header and printing the half-duty start times instead of the report time. Note: CTA understands that incorrect Leader/Follower information would be displayed during periods where there are day-type transitions: Weekday-Saturday, Saturday-Sunday, Sunday-Weekday
Rail Paddle (Specs 5.10.4)	Rail Paddle to display "Relieved by" with the duty number if relief type is Street relief. The following customization will be made: - Adjust pce_start_rail and pce_end_rail **attributes to consider any route and any place.** - Adjust pce_start_disp and pce_end_disp to ignore unattended street reliefs. - Adjust the report, block blcRe1PceStart3c to generate relief information similar to the block blcRelPceEnd3c: "Relieve 50113:52 at Howard **Sta. Nb**[11]. - Drop the R in duty number when there is a relief.
Bus Run guide (Duty list) (Specs 5.10.12)	The Bus Run guide (Duty list) is posted in support of the work pick process. The following customization will be made: - Display second report time on the header line. - Replace the attribute dty_time_startO by and equivalent half-duty attribute.
WTT & WTT Both **Directions**	The following customization will be made: Set default flag Show headway so it is always set whenever a schedule is accessed. - Investigate if it will be possible to toggle; otherwise it is acceptable to keep the field output. - There is no requirement to save the setting since **it will** always be set to TRUE. - **Requires some testing to confirm the final** setup.

Vsc08 - Vehicle statistics for Rail	**Addition of Car miles statistics.** GIRO suggests enabling the *HASTUS* Rail sub- system in CTA's *HASTUS* version 2016 and defining a second *HASTUS* icon to be used in the rail context. The Rail sub-system will provide access to windows specifically designed for Rail that replaced existing windows designed for Bus. This applies to Vsc08 which provides vehicle statistics and unit statistics with the Rail sub-system.
Customizations, configurations, and upgrades	**Task Orders** As dictated by the needs of the business, CTA may at its sole discretion purchase Professional Services via Task Orders, to support customizations, configurations, and upgrades. Upon request, each Task Order shall minimally include: 1. A detailed statement of work 2. Itemized deliverables 3. Names of assigned personnel, including personnel performing tasks on-premise or remotely 4. Corresponding hourly bill rate(s) for non-recurring Professional Services 5. A detailed project schedule 6. Progress reporting 7. Payments based upon Earned Value (or % project completion) 8. A support plan that demonstrates how risks will be mitigated and issues managed to comply with schedule constraints 9. A formal Quality Assurance procedure that includes User Acceptance prior to final payment