

I. Scope of Services – Hastus 2016 Upgrade

A. Overview

The Chicago Transit Authority (CTA) operates the nation's second-largest public transportation system and covers the City of Chicago and 35 surrounding suburbs. CTA has 1,867 buses that operate 130 bus routes and serve more than 10,900 posted bus stops. In addition, CTA rail fleet numbers include 1,492 vehicles which operate over eight rail lines.

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 18,000 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 2010, 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 scheduling practices and requirements in Hastus connected to our Collective Bargaining Agreement and bus and rail infrastructure.

This vendor recommends an upgrade every three to four years in order to take advantage of system enhancements and optimization improvements. Up to 30% of GIRO employees are engaged in research & development work; their scheduling technology is considered best-in-class. CTA currently operates a 2010 version of HASTUS and is due for an upgrade.

Therefore, CTA is seeking an upgrade from the current 2010 system to version 2016 to take advantage of new features. Furthermore, the upcoming integration with the Trapeze (TOPS) daily operations system will be more easily accomplished with the calendar enhancements found in GIRO, Inc.'s 2016 version of Hastus and an electric-bus scheduling feature that will enable CTA to optimize the 20+ new electric buses that will be added to the fleet.

B. 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.
 - Have 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:**
 - 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, MinBus/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 2010, unless noted by CTA.

C. Customer Service and Maintenance Support

Customer support as provided by GIRO's CTA project manager or back-up is required during the agency's regular business hours 08:00-16:30 (Central Time). During these hours, access to help desk resources is also a must and will be especially helpful to CTA Scheduling's technical 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. There are bugs or code not performing in accordance with the Detailed Design Specification. For **more complex projects**, CTA prefers an agreement where the agency can draw from a bank-of- days support purchased in advanced. In regard to contract detail, CTA is also open to an arrangement in which a multi-year maintenance support contract is purchased along with the application upgrade.

D. Upgrade Work and Services

The proposed work and services must include the following elements:

1. Project management
 - a. Organize and supervise the vendor's project team.
 - b. Prepare status reports as required.
2. Review and validation of system specifications.
3. Preparation of database conversion scripts to convert the database from version 2010 to version 2016. These scripts will be run by CTA personnel to upgrade the version in CTA's environment.
4. Configuration to initialize relevant variables, set parameters and make system adjustments
5. Migration of customized software to the new version. This involves vendor inspection of relevant customizations and application features.
6. Algorithm recalibration which involves review of the HASTUS cost functions rules and parameters. Also, calibrating the algorithms ensures that automatic solutions continue to meet on-going CTA requirements.
7. Testing prior to delivery of all customized features using a representative set of CTA data.
8. Customizations (9) created as of a result of GIRO's Gap Analysis visit in September 2014. These are described in Appendix A but may need to be revised as needed, including any changes in the Collective Bargaining Agreements with CTA's rail and bus unions.
9. Provide hands-on training to CTA Scheduling and Service Planning staff on the new features of Hastus 2016.
10. Provide implementation support answering functional questions and advising users on how to use the application effectively for CTA's scheduling needs.
11. Create / Recreate the role based security defined in the current Hastus release.

System Architecture

GIRO will provide Hastus 2016 network and server infrastructure design document using the CTA Architecture document template. The architecture document should include all required software, hardware and 3rd party software needed for proper execution and maintenance of the Hastus 2016 software. The design environment should include all configurations needed to correctly build the— Test environment, Production environment with dynamic failover with high availability configuration and offsite manual disaster recovery onto a mirrored site.

The system design should meet the minimum need of supporting 25 super users logged in at any given time with the ability to expand for up to 40 users. The system and its architecture should support a peak of 35 batch jobs run in parallel by both bus and rail scheduling super users. The architecture design should support dynamic failover and disaster recovery to a secondary CTA data center. GIRO will assist CTA in defining, configuring and establishing the infrastructure and failover / DR mechanism for the system. The system architecture should include a 99.9% uptime and be utilized 24/7 365 days a year. CTA requires that all upgraded environment be supported at a minimum under Window 2012. The windows servers should be virtual servers running under vSphere 5.x or later version. These virtual servers should also be supported under Microsoft Hyper-V in order to provide CTA with future flexibility. The system should support Oracle as RDBM database preferably running on AIX.

CTA will procure and built the server / network infrastructure based on the approved Architecture document as agreed by both parties. CTA will install the operating system, database RDBMS software and GIRO will install the Hastus application.

Project Management

GIRO will assign a project manager to ensure all work required to organize, supervise, plan, execute, control and deploy the Hastus 2016 system are executed efficiently and in line with the agreed project plan. The project plan should at minimum include agreed end user requirements, business needs, customizations approved, project schedule, project milestones and associated cost management, quality management plans, communication plan and contract management plans. The project manager will own all project management activities in accordance to industry PMO practices and CTA IT PMO procedures. The project manager will ensure that all milestone deliverables are quantity controlled and approved by all parties. GIRO is expected to use the tools and technologies that are aligned with CTA tools [Office 2010; SharePoint 2010, Visio 2010, Microsoft project 2010]. CTA prefers GIRO to use online SharePoint tool hosted by CTA to store project documents and records – issue, risk, decision log, change log etc. The project manager shall lead weekly status meetings, provide weekly status reports, ensure project issues / risks/ decisions are assigned / tracked to closure.

Quality Assurance:

GIRO should ensure quality control and assurance (“QA”) is built into each milestone delivery. The QA procedure should be agreed by both parties and be included as part of master project plan. GIRO should at minimum provide documented factory test cases / expected results / actual results, to cover all CTA customized scenario testing, enterprise interfaces and required data conversion testing. CTA server infrastructure and network infrastructure along with automated performance testing should be included in the factory test cases. GIRO should provide CTA business leads with User-acceptance test (“UAT”) case scenarios and ensure all errors recorded during the UAT phase are implemented.

End User Training:

The Contractor is required to provide in person training at CTA’s Headquarters at 567 W Lake St, Chicago. The Contractor is required to conduct separate training session for super-users and end-users as outlined below. In addition:

- a. The Contractor will develop training materials. The Contractor will send draft training materials to CTA six weeks before the training begins.
- b. Agendas and materials must be approved by CTA for each module before training begins and shall include:
 - I. Instructor Guides
 - II. Student Workbooks which include:
 - i. Screen shots to accompany system walk through
 - ii. Hands on activities
- c. Training shall be delivered end user format for the following user groups:
 - I. System Administrator and Super Users (Scheduling Managers and Coordinators)
 - II. End-users of Hastus Scheduling (Scheduling Analysts, Managers and Coordinators)

The training must be provided in two phases. The first phase of the training will include all super users and system administrators and will conclude before the start of user-acceptance (UAT) testing. Phase two will include all staff in the Scheduling department (14 total) and will take place after delivery of the customized and configured software. The end-user will cover the new features of the software since the last upgrade. Both phases of training must be completed before project deployment.

On-site Services:

GIRO should be available at CTA facility during the project requirements collection phase, system design & configuration review phase, hardware & infrastructure design phase, database conversion /

deployment launch and at other times as deemed essential during the project execution. The visits will occur on a mutually agreed upon dates.

APPENDIX A – Additional Customizations

<p>Public Timetable interface (Specs 5.9.2)</p>	<p>Public Timetable interface enhancement:</p> <ul style="list-style-type: none"> - For Bus and Rail: Include the headway in the interface. - For Rail: Generate the interface for all places, not only timing points. <p>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.</p>
<p>Roster report (Specs 5.9.6, 5.9.6.1, 5.9.6.2)</p>	<p>Roster report: Terminology adjustment to the title</p> <p>The following customization will be made:</p> <ul style="list-style-type: none"> - Add the option to change the report title to “Work week report
<p>Bus Supervisor Guide (Specs 5.10.1.1)</p>	<p>The report to be based on the customized Headway Report.</p> <p>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</p> <p>Final design will be determined in the Specifications phase.</p> <p>The following adjustments are under consideration:</p> <p>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.</p> <p>Eliminate the “To Gar” and “From Gar” columns.</p>
<p>Rail Supervisor Guide (Specs 5.10.1.2)</p>	<p>Crystal Reports adjustments as follows.</p> <p>Adjust the direction of the relief before the duty that covers the trip.</p> <p>Requires a UD field for Clockwise and Counterclockwise route.</p> <p>Display the timing point note after the timing point passing time.</p> <p>Shrink the text note box to minimum size.</p> <p>Added Reliefs to be underlined instead of having the “carrot” symbol, and add the relief note description in the note box.</p> <p>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</p>

	<p>trip's passing times if there is sufficient space. If not, then it will be printed on a second line.</p> <p>Crew-in not always printed correctly (bug covered by the maintenance contract).</p> <p>Crew Next Leave not always printed correctly (bug covered by the maintenance contract).</p>
Run Paddle (Specs 5.10.3)	<p>Keep Leader/Follower: Maintain Leader/Follower calculation.</p> <p>For 2-piece part-time duties, second reporting time (<i>SignOn</i>) 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.</p> <p>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</p>
Rail Paddle (Specs 5.10.4)	<p>Rail Paddle to display "Relieved by" with the duty number if relief type is Street relief.</p> <p>The following customization will be made:</p> <ul style="list-style-type: none"> - 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 blcRelPceStart3c to generate relief information similar to the block blcRelPceEnd3c: "Relieve 501 13:52 at Howard Sta. Nb". - Drop the R in duty number when there is a relief.
Bus Run guide (Duty list) (Specs 5.10.12)	<p>The Bus Run guide (Duty list) is posted in support of the work pick process.</p> <p>The following customization will be made:</p> <ul style="list-style-type: none"> - Display second report time on the header line. - Replace the attribute dty_time_start0 by and equivalent half-duty attribute.
WTT & WTT Both Directions	<p>The following customization will be made:</p> <p>Set default flag Show headway so it is always set whenever a schedule is accessed.</p> <ul style="list-style-type: none"> - 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	<p>Addition of Car miles statistics.</p> <p>GIRO suggests enabling the <i>HASTUS</i> Rail sub-system in CTA's <i>HASTUS</i> version 2016 and defining a second <i>HASTUS</i> icon to be used in the rail context.</p> <p>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</p>

	and unit statistics With the Rail sub-system.
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Improving efficiency at every turn

November 6, 2015

Mr. Mark L. Patzloff
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Chicago Transit Authority
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USA

Subject: Proposal for *HASTUS*[™] version 2016 upgrade – Chicago Transit Authority

Dear Mr. Patzloff:

GIRO Inc. is pleased to submit to the Chicago Transit Authority (CTA) the enclosed proposal for upgrading your *HASTUS* installation from version 2010 to version 2016.

The upgrade applies to the following modules: *Vehicle, Crew, CrewOpt, MinBus/MinRail, Roster, HASTOP, ATP, and Rider*. As the *Bid* module is not to be part of the proposed upgrade version, no fees are shown in this proposal for a *Bid* upgrade or maintenance and support for *Bid*.

A summarized list of new functionalities and features incorporated into successive *HASTUS* releases from version 2010 to version 2015 is attached, as well as the preliminary list for version 2016. The list of version 2016 functionalities and features will be forwarded to you when finalized.

As part of the upgrade training, time will be devoted to reviewing new functionalities and features relevant to CTA. If specific new features are key to this upgrade, we recommend that they be brought to GIRO's attention to confirm that they do not require additional implementation services.

The evaluation of the work and services required for the proposed upgrade is based on the report of the Gap Analysis that was conducted in fall 2014 by CTA and GIRO. Appendix A to this proposal outlines the enhancements requested by CTA for implementation with the *HASTUS* version upgrade; these were listed in Section 3 of the Gap Analysis report.

A diagram providing a summarized overview of the available *HASTUS* modules is presented in the attached document "*HASTUS – An integrated solution for transport scheduling and operations*", with the CTA modules highlighted.

Please note that GIRO is updating its standard *HASTUS* Maintenance and Support Contract by including an annual upgrade license fee for future upgrades as described below.

Upgrade license fee calculation

GIRO's maintenance policy that applies to previous versions of *HASTUS* offers license-free upgrade to the next two yearly *HASTUS* versions following your initial purchase or most recent upgrade. Upgrades thereafter are 10% of the regular license fee for each additional year, up to a maximum of 50%. The above requires that you keep an uninterrupted Maintenance and Support Contract.

License-fee calculations are based on peak vehicle level (maximum number of transit vehicles in use at peak time), and the relative cost of each selected module. License costs in this proposal are based on the licensed peak vehicle limit of 2,500 vehicles—the interval being 2,001–2,500. The next higher interval is 2,501–3,000. Please notify GIRO if an adjustment to the peak vehicle ceiling is required.

As your current version is *HASTUS 2010*, an upgrade license fee of \$ 632,800 (equal to 40% of your current license value in 2016 dollars) would apply to the version 2016 upgrade.

A new policy on upgrade license fees that will apply to subsequent upgrades is described in sections below.

The number of *HASTUS* users or concurrent sessions within CTA has no impact on *HASTUS* license fees. However, the number-of-users limit on the protection key should be set to a reasonable number so as to reduce the risk of non-authorized access to the software and data. Please note that there are no licensing fees levied by GIRO for sharing data between the *HASTUS* application or database and external systems or applications (CAD/AVL, APC, Google Transit GTFS, IVR, etc.).

Upgrade work and services

Based on the results of the Gap Analysis conducted in fall 2014, we have estimated that the work and services requirements for the version 2016 upgrade will be 361 person-days. The proposed work and services include the following elements:

- Project management: work required by the project manager to organize and supervise the project team and to prepare status reports as required.
- Specifications defining precisely how *HASTUS* will be configured and, if necessary, customized. GIRO proposes a review and validation of current specifications.
- GIRO will provide database-conversion scripts to convert the database from version 2010 to version 2016. The scripts will be run by CTA personnel prior to installation of the upgrade version in CTA's environment.
- Configuration to initialize relevant variables, set parameters, and make adjustments as needed.

- Migration of customized software to the new version. A number of functions had been customized in your current version. Some of these functions may have evolved in recent versions. Consequently, they must be carefully inspected with the intent to transfer relevant customizations while providing all new *HASTUS* features.
- Algorithm recalibration (e.g. *CrewOpt*, *MinBus/MinRail*, *Roster*): Improvements to algorithms are incorporated every year. Thus, we need to review the *HASTUS* cost function, rules, and parameters, as well as calibrating the algorithms to ensure that the automatic solutions continue to meet your requirements.
- Testing prior to delivery where all customized features will be tested using a representative set of CTA data.
- Training sessions where your staff will be shown the new features of the upgrade version. Training is planned on-site with your *HASTUS* installation and uses hands-on methodology. This proposal also includes training preparation time. The following training visits are planned:

Training task	Number of training days
New features – Network, Vehicle, Crew	3
New features – Calendar	2
<i>CrewOpt</i> , <i>Minbus</i> , <i>Roster</i>	4
<i>ATP/Rider</i>	2
<i>HASTOP</i>	1
Total	12

Table 1 – Planned training days on-site.

- Implementation support: GIRO staff will devote time to answering functional questions and advising users on how to use the application most effectively in your context.

In its evaluation of upgrade work and services, GIRO assumes that operational requirements remain unchanged since the previous *HASTUS* implementation. Therefore, any changes to work rules and parameters, and the resulting configuration and/or calibration effort, for example, are not included in this proposal.

The proposed work and services include the customization items outlined in Appendix A. A bank of 20 person-days is proposed for contingencies that may arise prior to completion of detailed design specifications (DDS).

Upgrade cost summary

The cost summary for upgrade to version 2016 is provided in Table 2. There is no warranty on the upgrade as the software used in production is covered under the Maintenance and Support Contract.

Description	Upgrade ¹
Upgrade License fees (2,500 peak vehicles)	\$ 632,800
Upgrade work and services	\$ 471,960
Bank of 20 person-days ²	\$ 26,100
Expenses ³	\$ 11,800
Total	\$1,142,660

Table 2 – Cost for HASTUS 2016 upgrade.

Notes:

1. Vehicle, Crew, CrewOpt, MinBus/MinRail, Roster, HASTOP, ATP, and Rider.
2. The proposed bank of days may be used at CTA's discretion for the upgrade or subsequently.

Costs in Table 2 include expenses for on-site visits and associated work and services to bring the upgrade version into production. Expenses include air fare, transportation, hotel, meals, and incidentals for the visits.

Project planning

The standard *HASTUS* version 2016 will be available for pre-installation configuration and customization starting in February 2016. Work would start in Montreal approximately four weeks after receiving your formal approval with the signed amended license or in February 2016, whichever occurs last. *HASTUS* version 2016 will remain available until November 15, 2016, for contract signature and initial installation. After November 2016, version 2017 will be proposed at 2017 pricing.

It is estimated that approximately 14 months will be required to complete the upgrade, assuming staff availability on both sides.

Conditions

Costs are expressed in US dollars and do not include taxes or duties that may apply, and for which CTA would be responsible. Cost information is based on 2016 pricing and is valid for 90 days. Your current *HASTUS* license would be amended to reflect the new installed version. It is assumed that the number of peak vehicles would not exceed the 2,500 limit as currently authorized in your license. If an increase in the number of peak vehicles is anticipated, please contact GIRO.

Any required hardware, system software, ancillary software or upgrade thereof (servers, operating system, relational database management system (Oracle[®]), Crystal Reports[®] software, Adobe PDF Writer, etc.) are not included. The System Requirements for *HASTUS 2016* document is not yet finalized. However, the System Requirements for *HASTUS 2015* document (attached) may be used as an interim guide until the new version 2016 of the System Requirements is available.

A new type of software protection key will be installed with *HASTUS* upgrades to version 2016 and beyond. The USB or physical protection key will no longer be used. It will be replaced by an encrypted license file linked to the client's IT infrastructure.

The proposed payment schedule for the upgrade is the following:

Item	Payment percentage
Delivery of project schedule and base software (uncustomized)	30%
Delivery of customized and configured software	50%
Acceptance of the software	20%

Table 3 – Proposed payment schedule – Version 2016 upgrade.

The percentages in Table 3 apply to the total cost of the upgrade project.

Upon system acceptance, the annual maintenance and support fees will be recalculated according to the price list effective at the time.

Software acceptance

A single acceptance milestone has been planned for the upgrade. Acceptance is reached when CTA provides acceptance confirmation or no later than 30 days following completion of work and delivery of the customized software, whichever occurs first. At the end of this period, the software shall be deemed to have been accepted unless CTA notifies GIRO in writing of any deviations from the Detailed Design Specifications document. In this event, GIRO shall make all necessary modifications to the software and shall re-submit the software for acceptance and CTA shall then have seven calendar days to re-test the software. In addition, the software is deemed accepted once used in an operational or "production" context.

New maintenance policy with annualized upgrade license costs

GIRO recently reviewed its licensing and maintenance model and implemented a new policy where annualized upgrade license fees for future upgrades will be paid as part of the Maintenance and Support Contract. The annualized upgrade license fee is paid on a yearly basis and covers licensing costs for an eventual upgrade. A payment representing 5% of the actual license value is required each year hence allowing the client to upgrade to a newer version of the *HASTUS* software at its convenience, leaving implementation costs (work, services and expenses) to be estimated by GIRO using the applicable daily rates and invoiced at the time of the upgrade.

This new policy replaces the previous model where the full upgrade license fees were paid at the time the upgrade was ordered. The new annualized upgrade license fees policy will help reduce the cost of future upgrades for most clients and also help streamline budgeting. The yearly license fee for future upgrades allows our clients to amortize the license cost of an upgrade over a given period and allows for increased flexibility in deciding when to upgrade.

Assuming CTA acquires the proposed version 2016 upgrade, the new maintenance and support policy would be applied the following year, at the annual Maintenance and Support Contract renewal planned for September 1, 2017. Once the new policy is in effect in your Maintenance and Support Contract, upgrade license fees for future upgrades will be prepaid.

Maintenance and support

The Maintenance and Support Contract costs will be revised upon new-version acceptance to reflect the updated *HASTUS* installation. Table 4 outlines the estimated maintenance and support costs for year 2016 for the current group of modules for 2,500 peak vehicles.

Maintenance and support period	Maintenance and support ¹	Maintenance mod. days (30 days)	Future upgrade license cost prepayment (5% of lic. value)	Yearly total
September 1, 2017, to August 31, 2018	\$163,000	\$36,200	\$81,100	\$280,300

Table 4 – Estimated maintenance and support costs for current modules – Year 2017.

Note:

1. Current modules: Vehicle, Crew, CrewOpt, MinBus/MinRail, Roster, HASTOP, ATP, Rider.

The Maintenance and Support Contract guarantees the client that GIRO will correct defects to its software (bugs or software not performing in accordance with Detailed Design Specifications), free of charge to the client. Not included in this aspect of the contract is additional customization, additional configuration, additional training, etc. The Maintenance and Support Contract also covers regular support where adequately trained *HASTUS* users can ask questions (by email or phone) regarding the software. It also provides discounts on the license cost of modules added subsequently. The above means that GIRO has the capability to maintain a copy of the *HASTUS* version installed at the client site, as well as compatible IT infrastructure (equipment, operating system, and database management system) equivalent to the client installation, so that all problems reported can be quickly investigated, and corrections identified.

We hope the information herein will be satisfactory. Please do not hesitate to contact the undersigned if you have any questions or if you require additional information. We appreciate your confidence in GIRO's software products and services, and we look forward to working with you and CTA staff on the proposed *HASTUS* enhancement project.

Yours truly,

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Appendix A – Additional customization

Table A-1 outlines additional customizations requested by CTA for implementation with the *HASTUS* version 2016 upgrade. These customizations were listed in Section 3 of the Gap Analysis report awaiting evaluation. The table includes summary information resulting from discussions between CTA and GIRO with the estimate in terms of person-days of work. Final design will be defined during the Detailed Design Specifications (DDS) phase.

A bank of 20 person-days is proposed as shown in the main proposal document for contingencies that may arise during the DDS. If not used during this project, the days will be kept in a bank until used at CTA's discretion for *HASTUS*-related work and services.

Reports	Comment	GIRO estimate
Public Timetable interface (Specs 5.9.2)	<p>Public Timetable interface enhancement:</p> <ul style="list-style-type: none"> - For Bus and Rail: Include the headway in the interface. - For Rail: Generate the interface for all places, not only timing points. <p>Attributes "Trp start headway" and "Trp end headway" can be added via configuration.</p> <p>CTA to confirm if this meets the requirement.</p> <p>To generate the interface for all places, all places including those that are not timing points must be listed in the place pattern.</p>	Estimate: 0.0
Roster report (Specs 5.9.6, 5.9.6.1, 5.9.6.2)	<p>Roster report: Terminology adjustment to the title</p> <p>The following customization will be made:</p> <ul style="list-style-type: none"> - Add the option to change the report title to "Work week report". 	Estimate: 0.5 day
Bus Supervisor Guide (Specs 5.10.1.1)	<p>The report to be based on the customized Headway Report.</p> <p>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.</p> <p>Shade every other line. A line can be multiple if OX</p> <p>Final design will be determined in the Specifications phase.</p> <p>The following adjustments are under consideration:</p> <ul style="list-style-type: none"> 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. <p>Eliminate the "To Gar" and "From Gar" columns.</p>	Estimate: 20 days (Based on email communications)



Reports	Comment	GIRO estimate
Rail Supervisor Guide (Specs 5.10.1.2)	<p>Crystal Reports adjustments as follows.</p> <p>Adjust the direction of the relief before the duty that covers the trip.</p> <p>Requires a UD field for Clockwise and Counterclockwise route.</p> <p>Display the timing point note after the timing point passing time.</p> <p>Shrink the text note box to minimum size.</p> <p>Added Reliefs to be underlined instead of having the "carrot" symbol, and add the relief note description in the note box.</p> <p>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.</p> <p>Crew-in not always printed correctly (bug covered by the maintenance contract).</p> <p>Crew Next Leave not always printed correctly (bug covered by the maintenance contract).</p>	Estimate: 5 days (Based on email communications)
Run Paddle (Specs 5.10.3)	<p>Keep Leader/Follower:</p> <p>Maintain Leader/Follower calculation.</p> <p>For 2-piece part-time duties, second reporting time (<i>SignOn</i>) 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.</p> <p>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.</p>	Estimate: 5 days.
Rail Paddle (Specs 5.10.4)	<p>Rail Paddle to display "Relieved by" with the duty number if relief type is Street relief.</p> <p>The following customization will be made:</p> <ul style="list-style-type: none"> - 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 blcRelPceStart3c to generate relief information similar to the block blcRelPceEnd3c: "Relieve 501 13:52 at Howard Sta. Nb". - Drop the R in duty number when there is a relief. 	Estimate 2 days.
Bus Run guide (Duty list) (Specs 5.10.12)	<p>The Bus Run guide (Duty list) is posted in support of the work pick process.</p> <p>The following customization will be made:</p> <ul style="list-style-type: none"> - Display second report time on the header line. - Replace the attribute dty_time_start0 by and equivalent half-duty attribute. 	Estimate: 0.5 day.
WTT & WTT Both Directions	<p>The following customization will be made:</p> <p>Set default flag Show headway so it is always set whenever a schedule is accessed.</p> <ul style="list-style-type: none"> - 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. 	Estimate: 1 day.



Reports	Comment	GIRO estimate
Vsc08 – Vehicle statistics for Rail	<p>Addition of Car miles statistics.</p> <p>GIRO suggests enabling the <i>HASTUS</i> Rail sub-system in CTA's <i>HASTUS</i> version 2016 and defining a second <i>HASTUS</i> icon to be used in the rail context.</p> <p>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.</p>	Estimate: 1 day.

Table A-1 – Additional customizations requested by CTA.