



EVOLUCIÓN Y MEJORES PRÁCTICAS DE COMUNICACIONES EN ENTORNOS SUBTERRÁNEOS.

OPTIMIZACIÓN Y TECNOLOGÍAS A PRUEBA DE FUTURO

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Regional Manager LATAM



Nuestros agradecimientos a CTES



GALEO GALILEI

El astrónomo, filósofo, matemático y físico revolucionario
la observación, la experimentación y la medición
fundando las bases de la Mecánica Moderna
y crea el telescopio astronómico.



ELEMENTOS DE MECANICA INVENTADOS POR GALILEO GALILEI

El gran Galileo inventa el primer
telescopio que al mirar el cielo
le revela mundos que el ojo humano
nunca vio. Con su invento
cambia el mundo que conocemos
y abre el camino de la astronomía.



CATEDRAL DE PISA

$$T = 2\pi\sqrt{\frac{l}{g}}$$

T periodo de oscilación
l longitud del péndulo
g aceleración de la gravedad



Contenidos

01

Rol Clave – Infraestructura Comunicaciones

02

Infraestructura comunicaciones

03

Soluciones disponibles

04

Casos aplicados

05

Disrupción

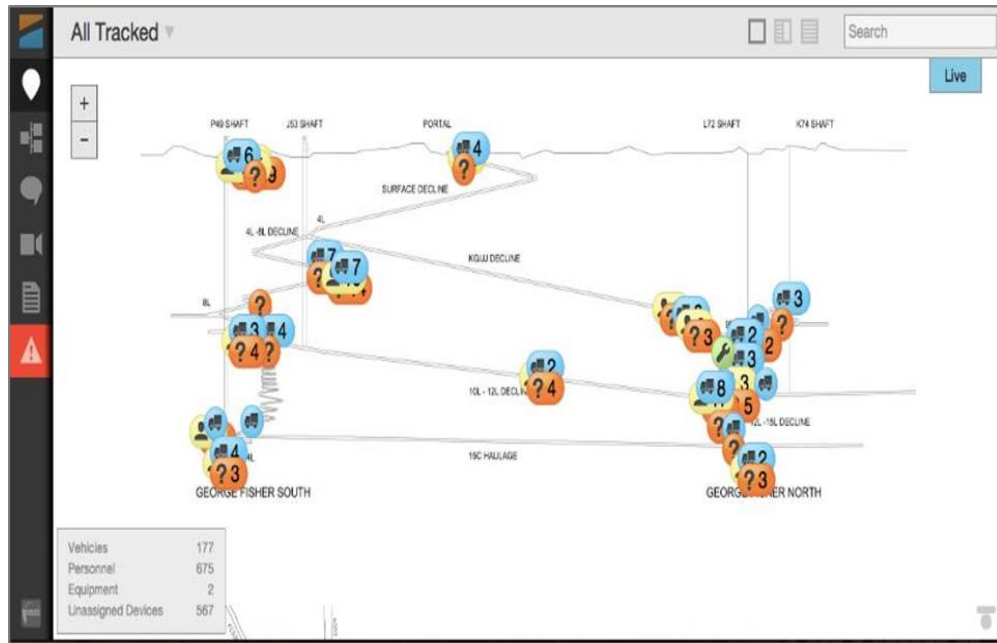
¿Por qué es Clave?



CTES

COMITÉ DE TÚNELES Y
ESPACIOS SUBTERRÁNEOS
DE CHILE





Aumento Seguridad



Aumento Productividad



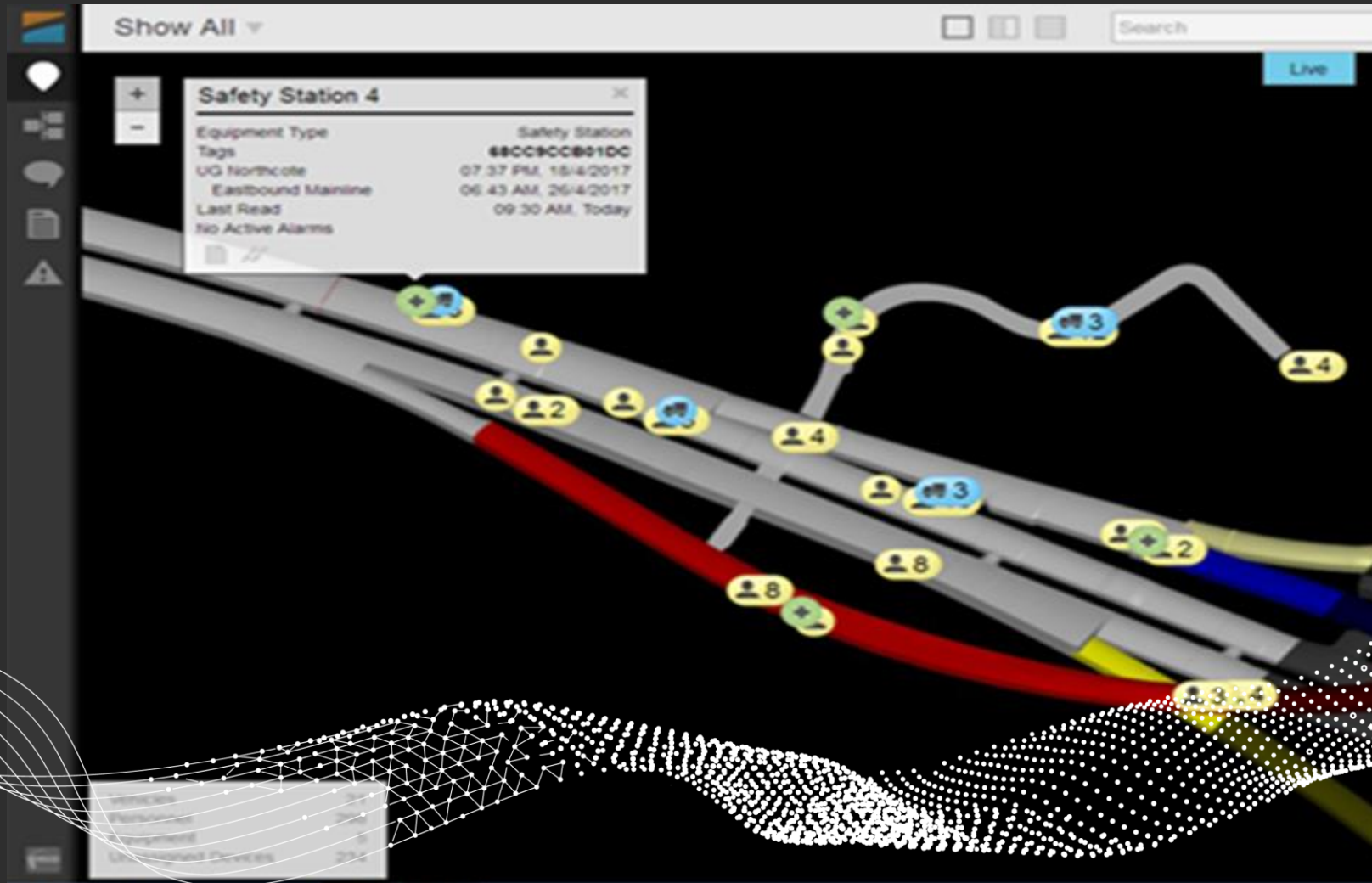
Aumento Seguridad

The screenshot displays the MineDash software interface. On the left is a dark sidebar with navigation options: Tracking, Network, Mensajes, Informes, and Alarmas. The main area shows a map with several tracked locations marked with yellow person icons and labels:

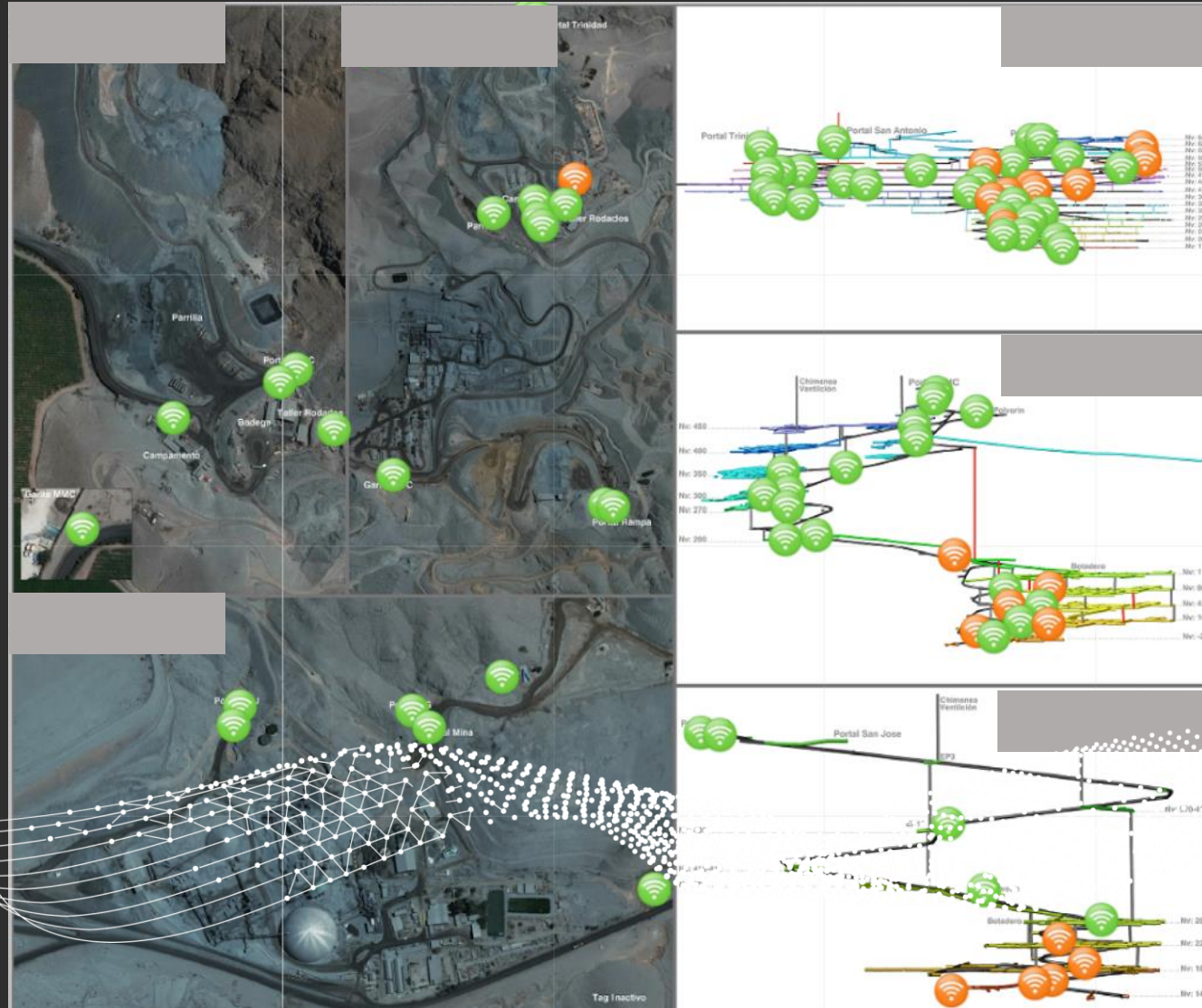
- 82-Vieta M.Y. (ID: 00000000000000000000)
- 37-Saldana Cotina Rog... AESA- ING. EHS - Guada... (ID: 00000000000000000000)
- AESA- ING. JUNIOR- Mar... (ID: 00000000000000000000)
- 30-Alfonso Yala Richar... 38-Mencio Salvador Ed... (ID: 00000000000000000000)
- 54-Prudencio Hinostroza... (ID: 00000000000000000000)

At the bottom of the map area, there is a status bar showing 'Personal' and the number '50'. The Windows taskbar is visible at the very bottom of the screen.

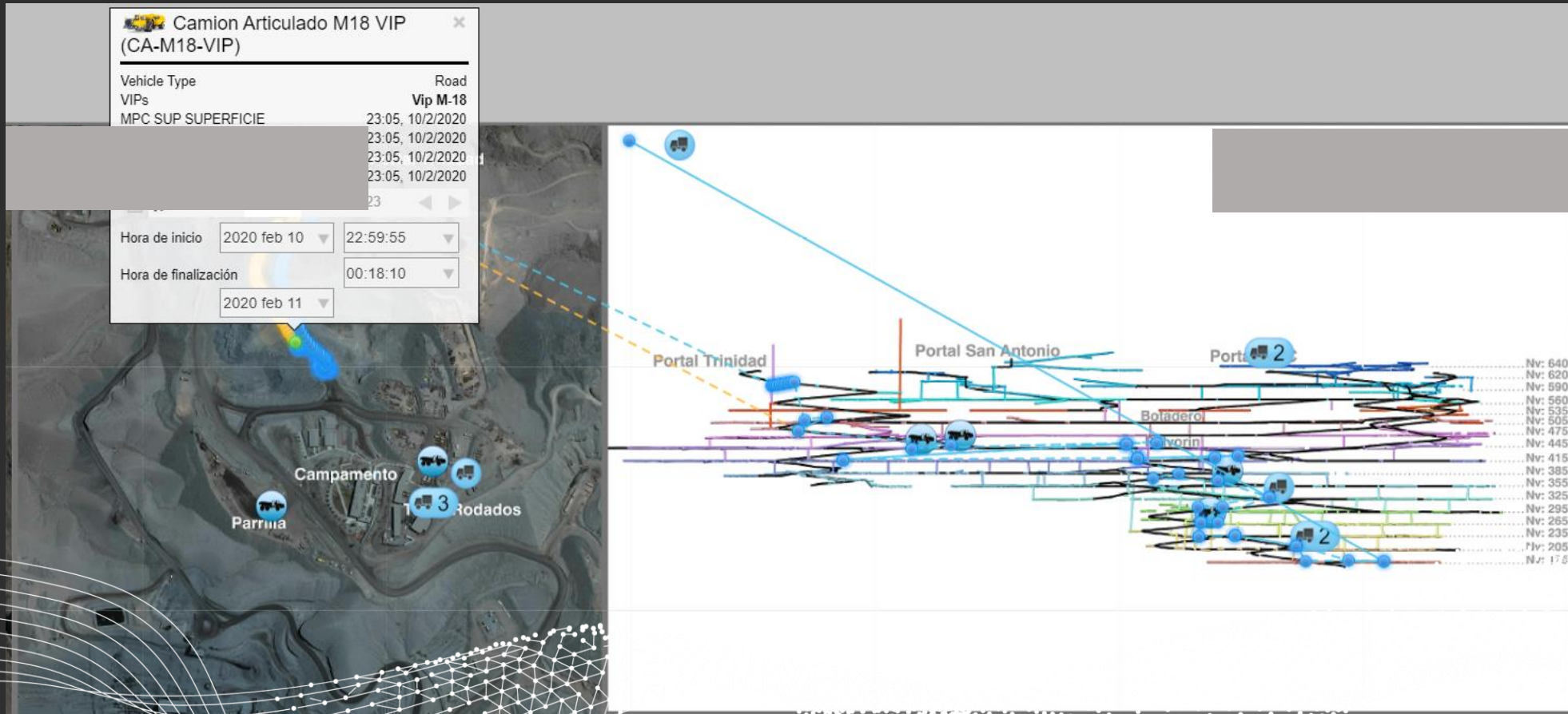
Aumento Seguridad



Aumento Seguridad



Aumento Seguridad



Aumento Seguridad

surface/underground ▾

All surface

Name	Last Location	Last Read
Klaes Robert	Surface	06:55 AM, 1/11/2017
Brown Gary	Surface	01:10 PM, Today
Smith Bryan	Surface	01:08 PM, Today
Foster R. Scott	Surface	06:52 AM, Today
Kriebel Shawn	Surface	04:39 PM, 29/10/2017
Hoffman Ronald	Surface	12:52 PM, Today
Cowan Steven	Surface	01:10 PM, Today
Bartley Deneice	Surface	01:10 PM, Today
Losco Sara	Surface	01:10 PM, Today
Seotic Heffern	Surface	01:10 PM, Today
Foster Darrin	Surface	06:59 AM, 1/11/2017
Lalley David	Surface	06:46 PM, 2/11/2017
Buckley Douglas	Surface	06:55 AM, Today
Savage Julian	Surface	06:55 AM, Today
Hayden John	Surface	06:53 AM, 1/11/2017
Owendale Jacob	Surface	06:53 AM, Today
GSRs Truck	-	03:34 AM, 8/12/2016
Baird Lee R.	Surface	01:10 PM, Today
Marshall Frank	Surface	01:09 PM, Today
Collingwood Kyle	Surface	06:52 PM, 2/11/2017

Showing 1 - 20 out of 23

All surface - Count

All Underground

Name	Last Location	Last Read
Lasher Mike	Underground	01:08 PM, Today
Veith Daniel	Underground	01:07 PM, Today
Dean Laraleigh	Underground	01:09 PM, Today
Hughes Adam	Underground	11:48 AM, 29/6/2017
Difenbaugh Chuck	Underground	12:43 AM, 22/10/2017
Egley Dave	Underground	01:09 PM, Today
Phone 1011	Underground	08:17 AM, 28/9/2017
Wingard Fred	Underground	03:01 PM, 30/10/2017
Guth Mark	Underground	01:10 PM, Today
Thompson Jason	Underground	01:09 PM, Today
Spare 1 GRE	Underground	03:02 PM, 15/9/2017
Kennedy Victor	Underground	01:10 PM, Today
Guiste Exc	Underground	12:39 AM, 4/5/2017
#2 R&R	Underground	06:47 PM, 2/11/2017
SSA	Underground	01:10 PM, Today
Obman Jason	Underground	12:16 AM, Today
Milford Randy	Underground	01:10 PM, Today
Hughes Adam	Underground	01:09 PM, Today
Powers Tom	Underground	01:09 PM, Today
Maintenance Spare 3	Underground	07:03 AM, 20/10/2017

Showing 1 - 20 out of 164

All Underground - Count


Aumento Seguridad

Vehicle Status Search

All Vehicles Surface - Count

22

Parking Bay Camera




All Vehicles Surface

UHT144	Maintenance Building
UTR083	Maintenance Building
UTR084	Maintenance Building
UFL028	Admin Building
UHT061	Admin Building
UFR008	Admin Building
UTR145	Admin Building
USL008	Maintenance Building
ULD054	Maintenance Building
UTR147	Admin Building
ULD065	Admin Building
UHT051	Admin Building
UJM043	Admin Building
UDR063	Admin Building
UTR073	Admin Building
UFR012	Maintenance Building
UHT062	Admin Building
UTR087	Admin Building
USL003	Maintenance Building

All Vehicles Workshop - Count

7

Workshop Camera



All Vehicles Workshop

UDR050	4450 Mobile Shop
UFL023	4450 Mobile Shop
UTR113	4450 Mobile Shop
UTR136	4450 Mobile Shop
UTR093	4450 Mobile Shop
UTR072	4450 Mobile Shop
UGR004	4450 Mobile Shop

All Vehicles In Transit - Count

60

All Vehicles In Transit

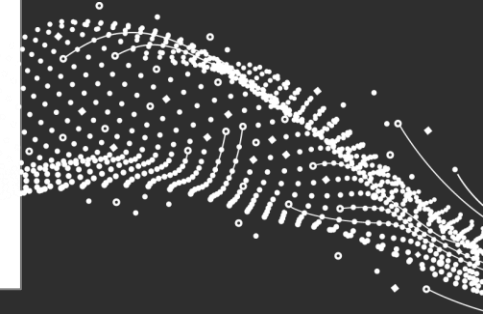
UTR083	LV 4900 Ramp
UTR084	LV 4380
UFL028	LV 4900 Ramp
UHT051	LV 4400
UFR008	LV 4450
UTR145	LV 4315 Belts
USL008	LV 4315 Belts
ULD054	LV 4490-95
UTR147	Full House
ULD065	LV 4450
UHT051	LV 4400
UJM043	LV 4359
UDR063	LV 4490-95
UTR073	LV 4315 Belts
UFR012	LV 4315 Belts
UHT062	LV 4400
UTR087	LV 4315 Belts
USL003	LV 4315 Belts
ULT007	LV 4450
UWT007	LV 4450
UTR146	LV 4450
UCR001	One Bin 2
UDR051	LV 4490-95
UTR144	Turf 4180
UTR114	LV 4315 Belts
VY7964	Turf 4200
JL D978	LV 4510
UFR002	LV 4315

Trip History Last 8h - All Vehicles - Count

198

Trip History Last 8h - All Vehicles

Name	Start Zone	End Zone	End Time
UTR083	LV Decline South R...	LV 4900 Ramp	11:24 PM, 23/5/2013
UTR084	LV Decline South R...	LV 4380	11:23 PM, 23/5/2013
ULD054	LV Decline South R...	LV 4490-95	07:35 PM, 23/5/2013
UTR147	LV Decline South R...	Full House	06:54 PM, 18/6/2013
ULD065	LV Decline South R...	LV 4450	11:24 PM, 23/5/2013
UHT051	LV Decline South R...	LV 4400	11:10 PM, 23/5/2013
UJM043	LV Decline South R...	LV 4359	11:16 PM, 23/5/2013
UDR063	LV Decline South R...	LV 4490-95	11:20 PM, 23/5/2013
UTR073	LV Decline South R...	LV 4315 Belts	11:18 PM, 23/5/2013
UFR012	LV Decline South R...	LV 4315 Belts	09:42 PM, 23/5/2013
UHT062	LV Decline South R...	LV 4400	11:24 PM, 23/5/2013
UTR087	LV Decline South R...	LV 4315 Belts	11:16 PM, 23/5/2013
USL003	LV Decline South R...	LV 4315 Belts	11:15 PM, 23/5/2013
ULT007	LV Decline South R...	LV 4450	11:14 PM, 23/5/2013
UWT007	LV Decline South R...	LV 4450	10:12 PM, 23/5/2013
UTR146	LV Decline South R...	LV 4450	11:24 PM, 23/5/2013
UCR001	LV Decline South R...	One Bin 2	11:25 PM, 23/5/2013
UDR051	LV Decline South R...	LV 4490-95	03:45 AM, 22/5/2013
UTR144	LV Decline South R...	Turf 4180	07:51 AM, 23/5/2013
UTR114	LV Decline South R...	LV 4315 Belts	10:58 PM, 23/5/2013
UHT064	LV Decline South R...	Turf 4200	11:23 PM, 23/5/2013
ULD068	LV Decline South R...	LV 4510	09:38 PM, 23/5/2013
UGR005	LV Decline South R...	LV 4380	12:17 PM, 23/5/2013
UFR009	LV Decline South R...	LV 4315 Belts	11:32 PM, 23/5/2013
UFL027	LV Decline South R...	LV 4979	11:28 PM, 23/5/2013
UWT012	LV Decline South R...	LV 4450	11:12 PM, 23/5/2013

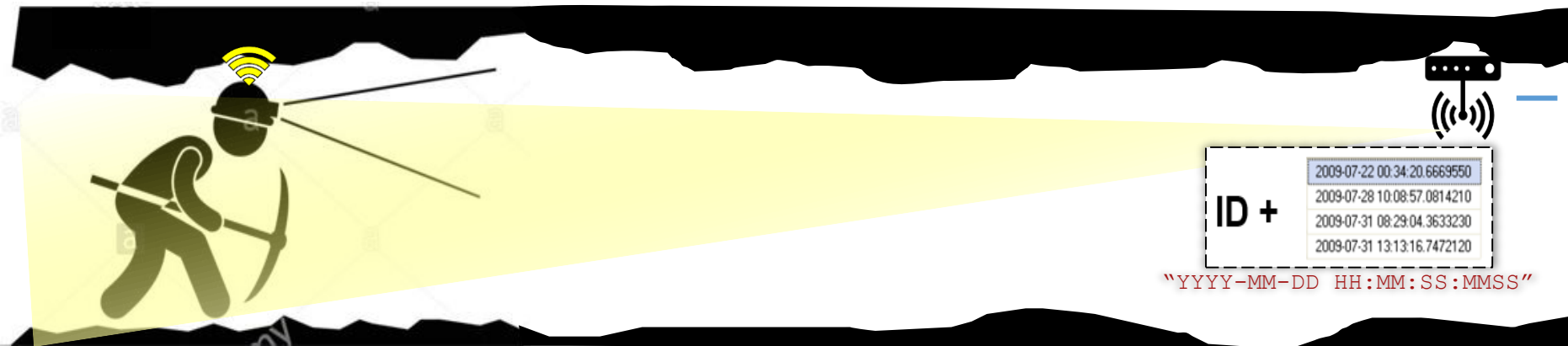


¿Cómo funciona el tracking de personas?

Tracking sobre red Wi-Fi – Facilidad para hacer seguimiento a personas.



Data Center en Superficie



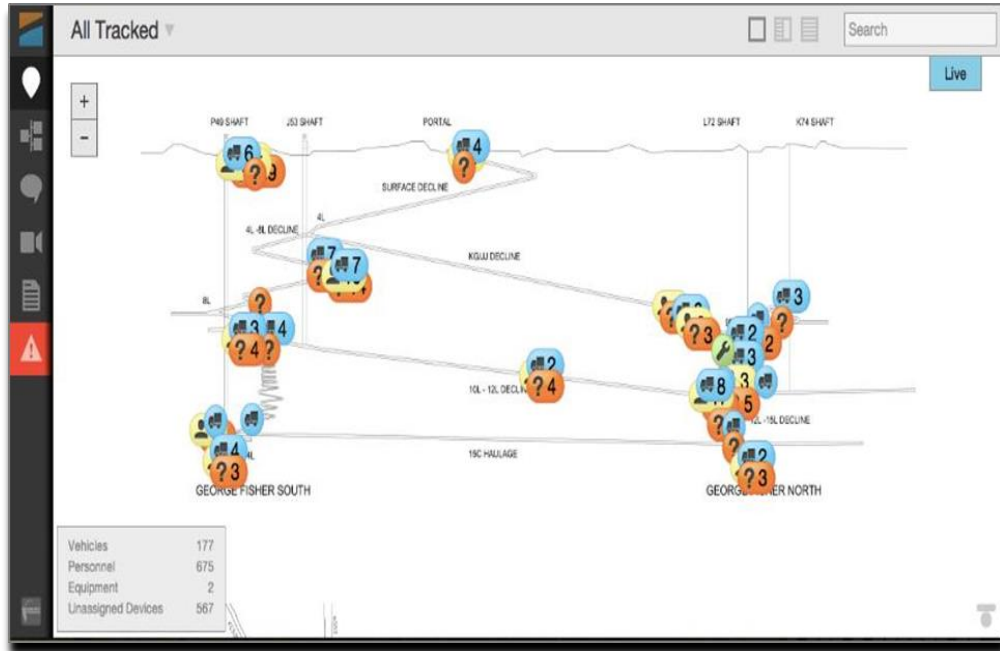
¿Cómo funciona el tracking de vehículos?

Tracking sobre red Wi-Fi – Facilidad para hacer seguimiento a equipos.



Data Center en Superficie





Aumento Seguridad



Aumento Productividad



Aumento Productividad

surface/underground ▾

All surface

Name	Last Location	Last Read
Klaes Robert	Surface	06:55 AM, 1/11/2017
Brown Gary	Surface	01:10 PM, Today
Smith Bryan	Surface	01:08 PM, Today
Foster R. Scott	Surface	06:52 AM, Today
Kriebel Shawn	Surface	04:39 PM, 29/10/2017
Hoffman Ronald	Surface	12:52 PM, Today
Cowan Steven	Surface	01:10 PM, Today

All Underground

Name	Last Location	Last Read
Lasher Mike	Un	
Veith Daniel	Un	
Dean Laraleigh	Un	
Hughes Adam	Un	
Difenbaugh Chuck	Un	
Egley Dave	Un	
Phone 1011	Un	
Wingard Fred	Un	
Guth Mark	Un	
Thompson Jason	Un	
Spore 1 GRE	Un	
Kennedy Victor	Un	
Guiste Exc	Un	
#2 R&B	Un	
SSA	Un	
Obman Jason	Un	
Milford Randy	Un	
Hughes Adam	Un	
Powers Tom	Un	
Maintenance Spare 3	Un	

Vehicle Status ▾

All Vehicles Surface - Count

22

All Vehicles Workshop - Count

7


All Vehicles In Transit - Count

60


Trip History Last 8h - All Vehicles - Count

198

Parking Bay Camera



Workshop Camera



All Vehicles In Transit

UTR083	LV 4900 Ramp
UTR084	LV 4380
UFL028	LV 4900 Ramp
LHT061	LV 4400
UFR008	LV 4450
UTR145	LV 4315 Belts
USL008	LV 4315 Belts
ULD054	LV 4490-95
UTR147	Full House
ULM043	LV 4359
UDR063	LV 4450
LHT051	LV 4400
UJM043	LV 4359
UDR063	LV 4490-95
UTR073	LV 4315 Belts
UFR012	LV 4315 Belts
LHT062	LV 4400
UTR087	LV 4315 Belts
USL003	LV 4315 Belts
ULM043	LV 4450
LWT007	LV 4450
UTR146	LV 4450
UCR001	One Bin 2
UDR051	LV 4490-95
UTR144	LV 4315 Belts
UTR114	LV 4315 Belts
LHT064	LV 4315 Belts
ULD068	LV 4510
UGR005	LV 4380

Trip History Last 8h - All Vehicles

Name	Start Zone	End Zone	End Time
UTR083	LV Decline South R...	LV 4900 Ramp	11:24 PM, 23/5/2013
UTR084	LV Decline South R...	LV 4380	11:23 PM, 23/5/2013
ULD054	LV Decline South R...	LV 4490-95	07:35 PM, 23/5/2013
UTR147	LV Decline South R...	Full House	06:54 PM, 18/6/2013
ULD065	LV Decline South R...	LV 4450	11:24 PM, 23/5/2013
LHT051	LV Decline South R...	LV 4400	11:10 PM, 23/5/2013
UJM043	LV Decline South R...	LV 4359	11:16 PM, 23/5/2013
UDR063	LV Decline South R...	LV 4490-95	11:20 PM, 23/5/2013
UTR073	LV Decline South R...	LV 4315 Belts	11:18 PM, 23/5/2013
UFR012	LV Decline South R...	LV 4315 Belts	09:42 PM, 23/5/2013
LHT062	LV Decline South R...	LV 4400	11:24 PM, 23/5/2013
UTR087	LV Decline South R...	LV 4315 Belts	11:16 PM, 23/5/2013
USL003	LV Decline South R...	LV 4315 Belts	11:15 PM, 23/5/2013
ULM043	LV Decline South R...	LV 4450	11:14 PM, 23/5/2013
LWT007	LV Decline South R...	LV 4450	10:12 PM, 23/5/2013
UTR146	LV Decline South R...	LV 4450	11:24 PM, 23/5/2013
UCR001	LV Decline South R...	One Bin 2	11:25 PM, 23/5/2013
UDR051	LV Decline South R...	LV 4490-95	03:45 AM, 22/5/2013
UTR144	LV Decline South R...	Turf 4180	07:51 AM, 23/5/2013
UTR114	LV Decline South R...	LV 4315 Belts	10:58 PM, 23/5/2013
LHT064	LV Decline South R...	Turf 4200	11:23 PM, 23/5/2013
ULD068	LV Decline South R...	LV 4510	09:26 PM, 23/5/2013
UGR005	LV Decline South R...	LV 4380	10:17 PM, 23/5/2013
UFR009	LV Decline South R...	LV 4315 Belts	11:22 PM, 23/5/2013
UFL027	LV Decline South R...	LV 4875	11:25 PM, 23/5/2013
LWT012	LV Decline South R...	LV 4450	11:12 PM, 23/5/2013

CTES COMITÉ DE TÚNELES Y ESPACIOS SUBTERRÁNEOS DE CHILE

MST

Aumento Productividad



Equipos

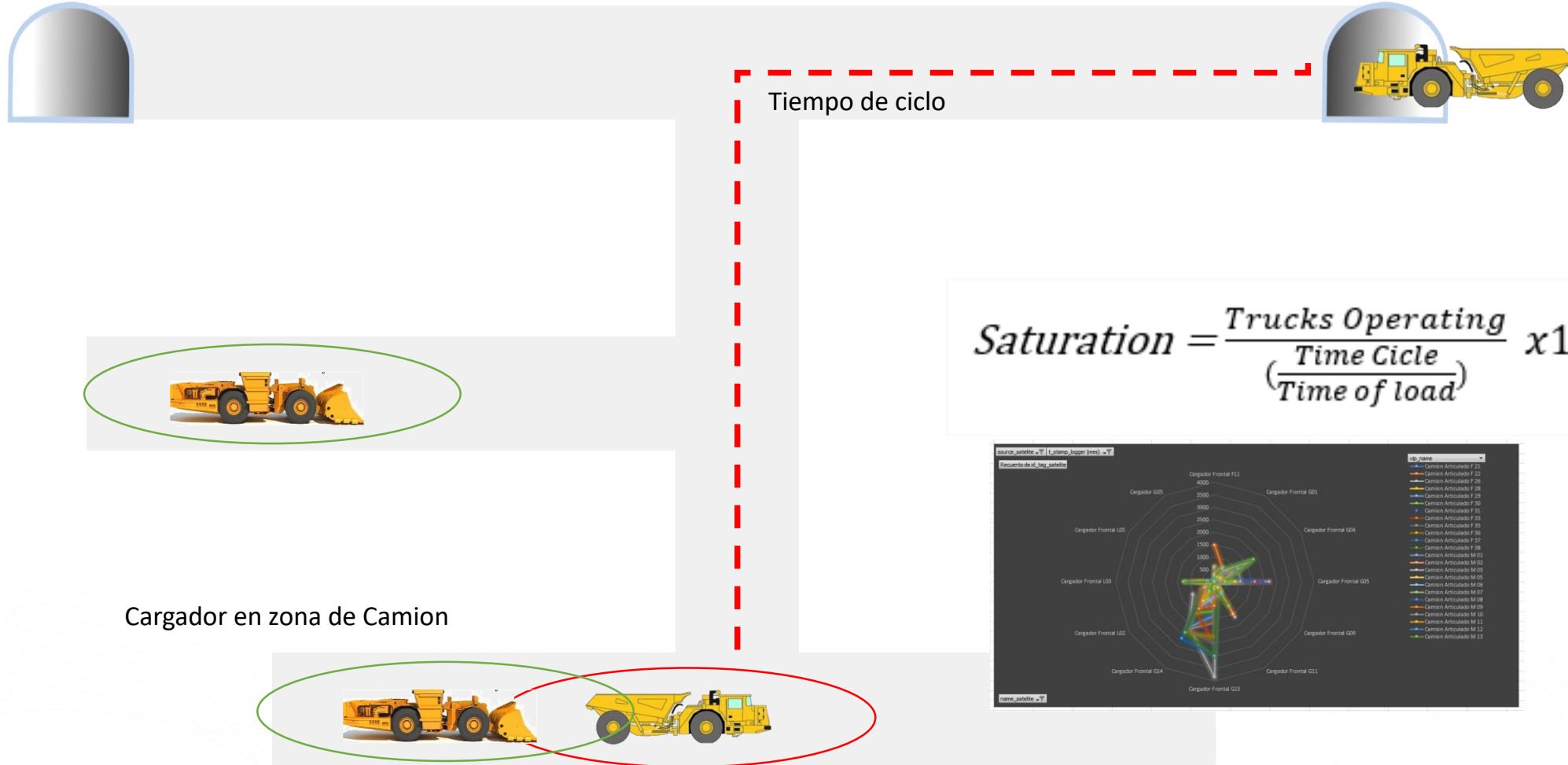
Aumento Productividad



Equipos

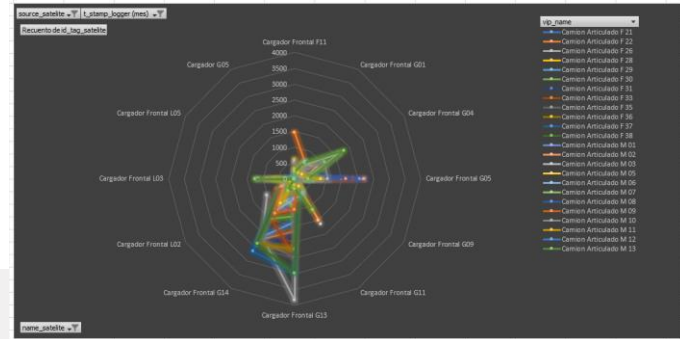
Aumento Productividad

Truck waiting
KPI of Fleet
Saturation

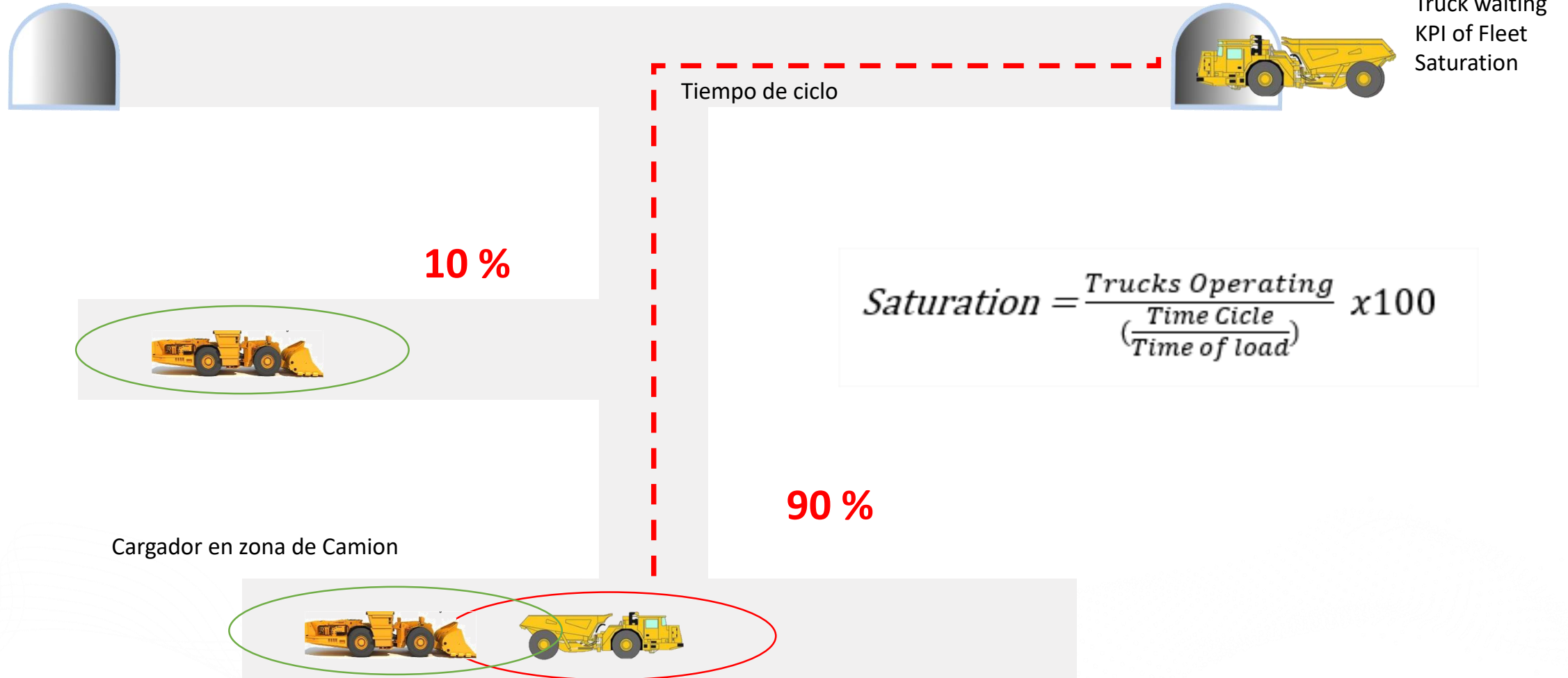


$$Saturation = \frac{Trucks\ Operating}{\left(\frac{Time\ Cycle}{Time\ of\ load}\right)} \times 100$$

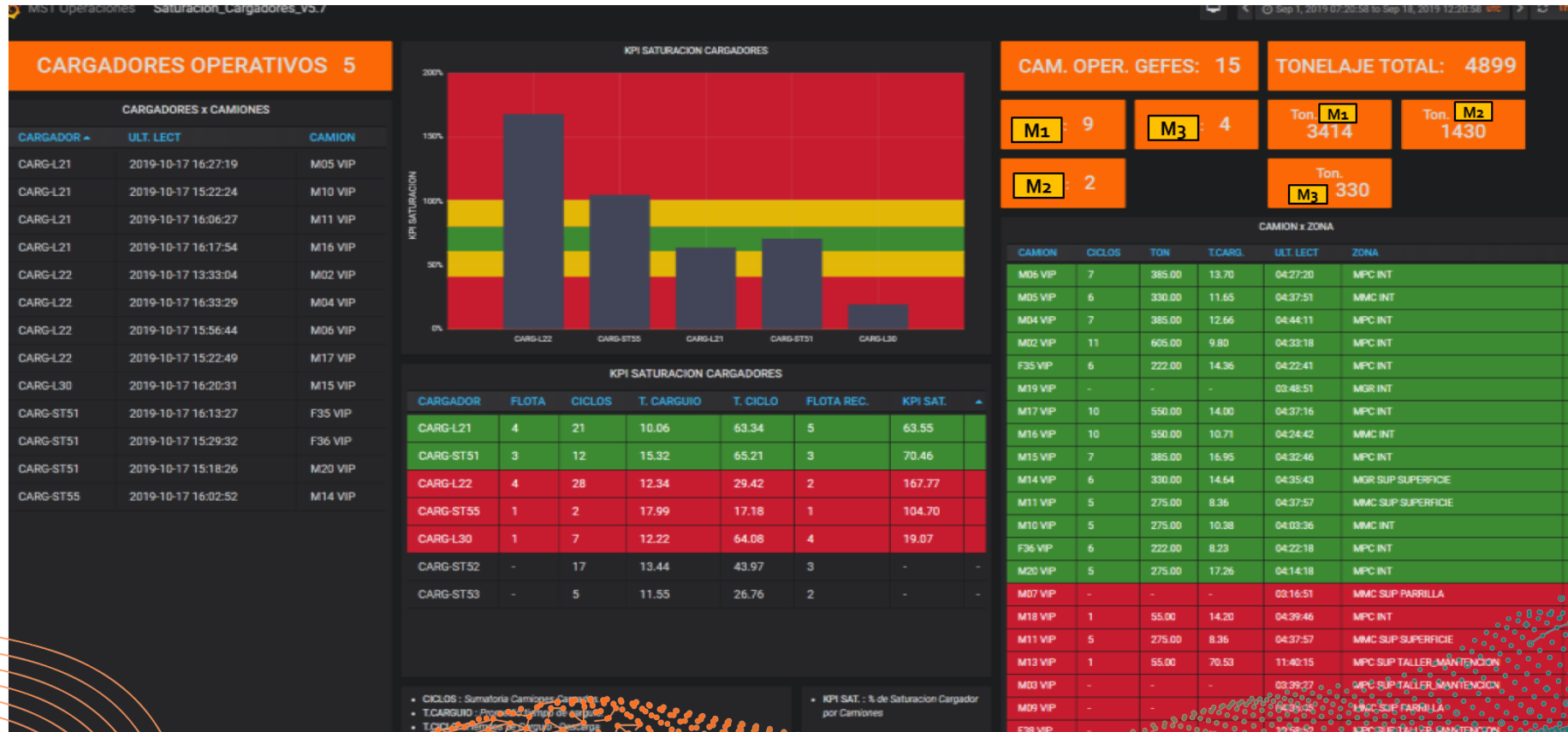
Cargador en zona de Camion



Aumento Productividad

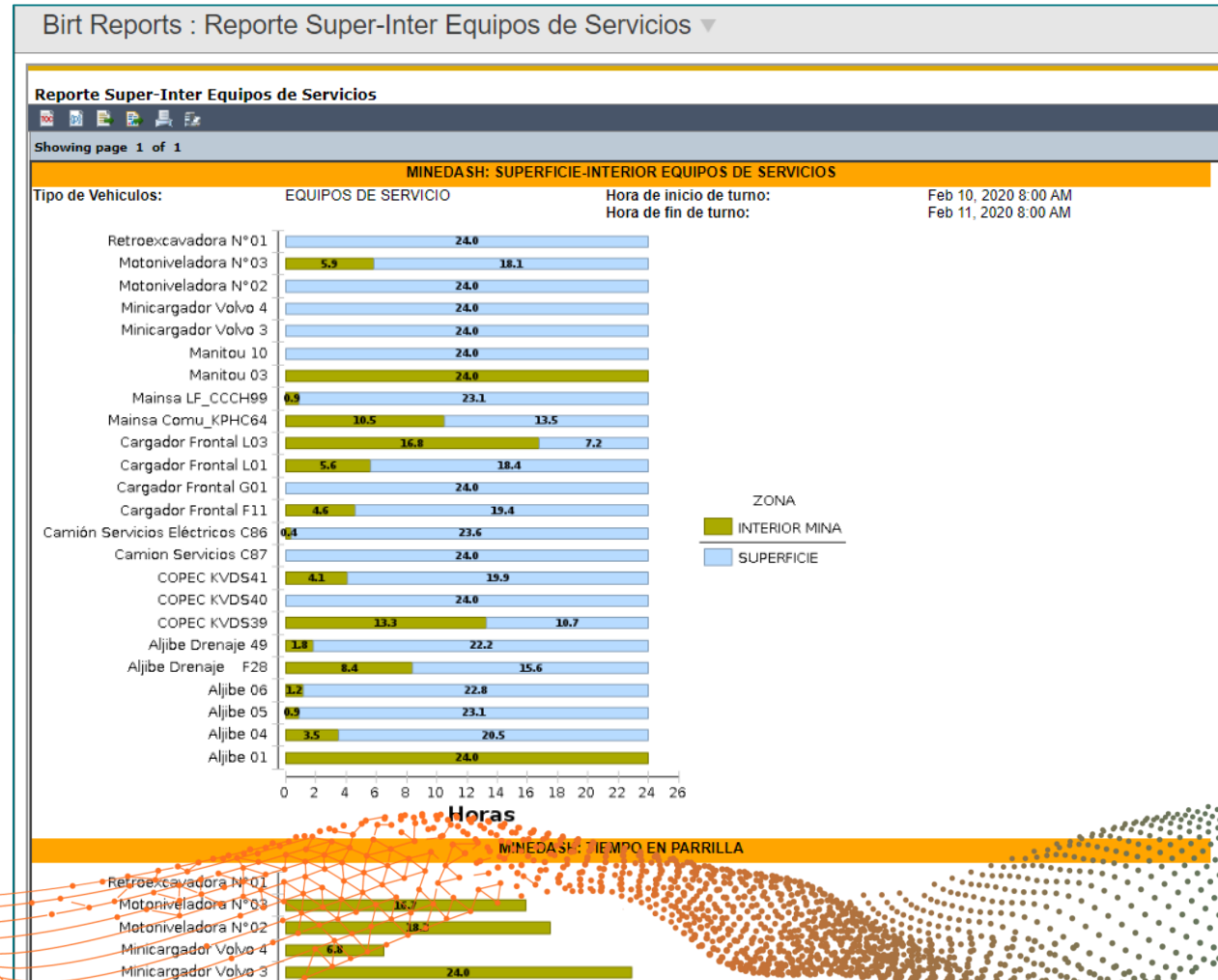


Aumento Productividad

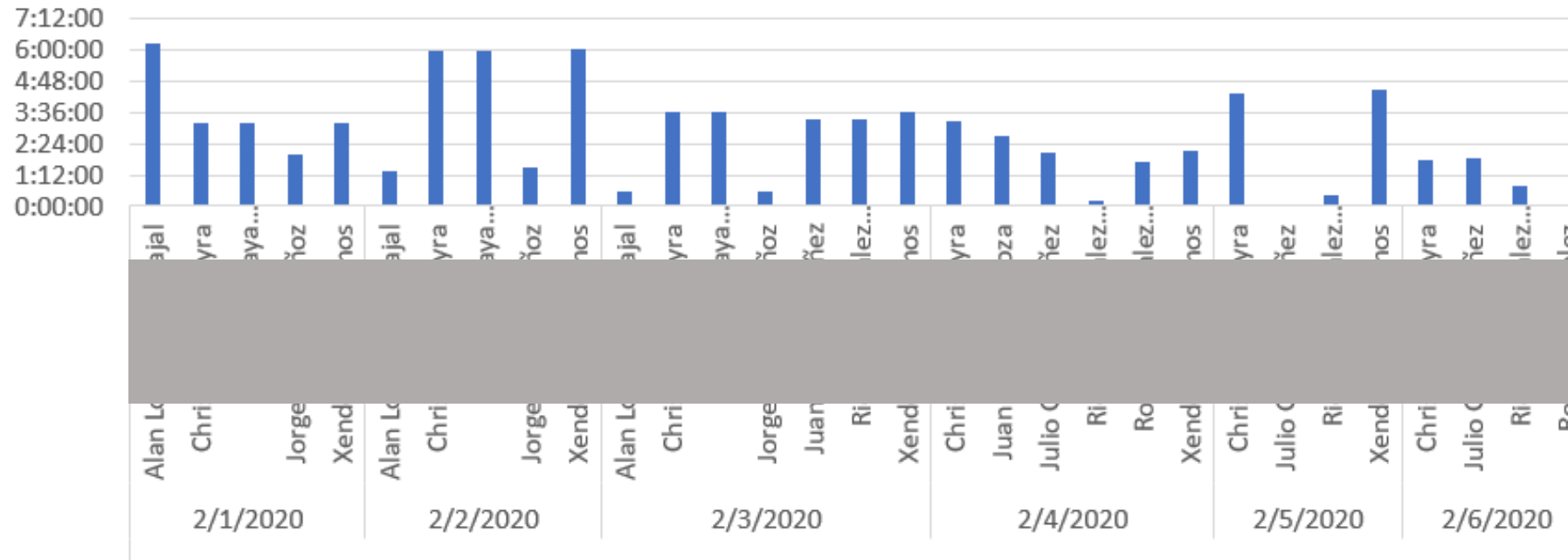


Equipos

Aumento Productividad



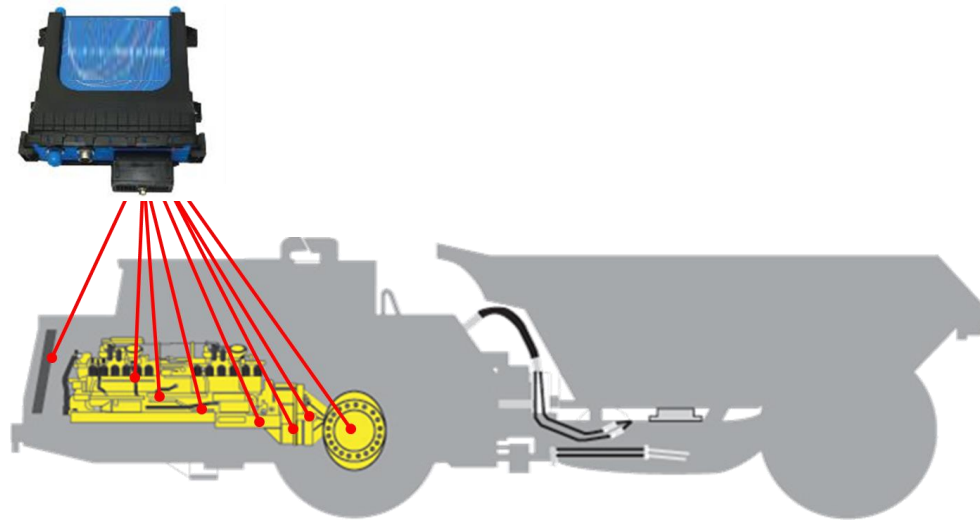
Aumento Productividad



Aumento Productividad

> Ejemplos de información extraíble..

- Estado del motor
- Horas del equipo en Stand-by
- Frenos
- Aceite
- Temperatura
- Niveles de combustible



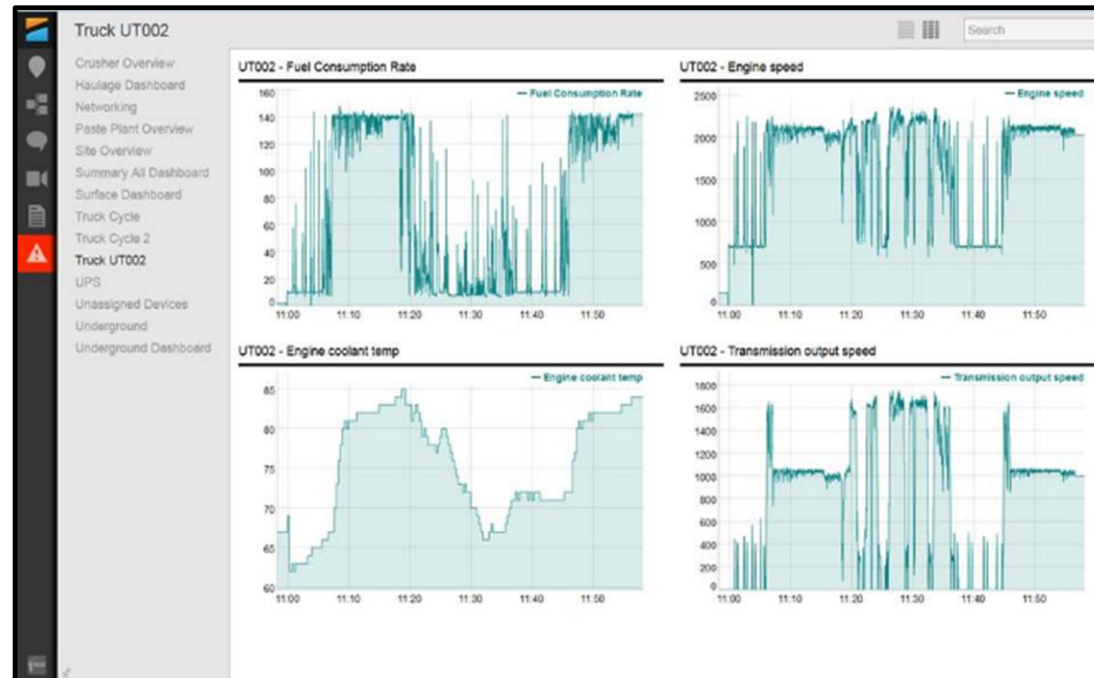
Mantenimiento



Aumento Productividad

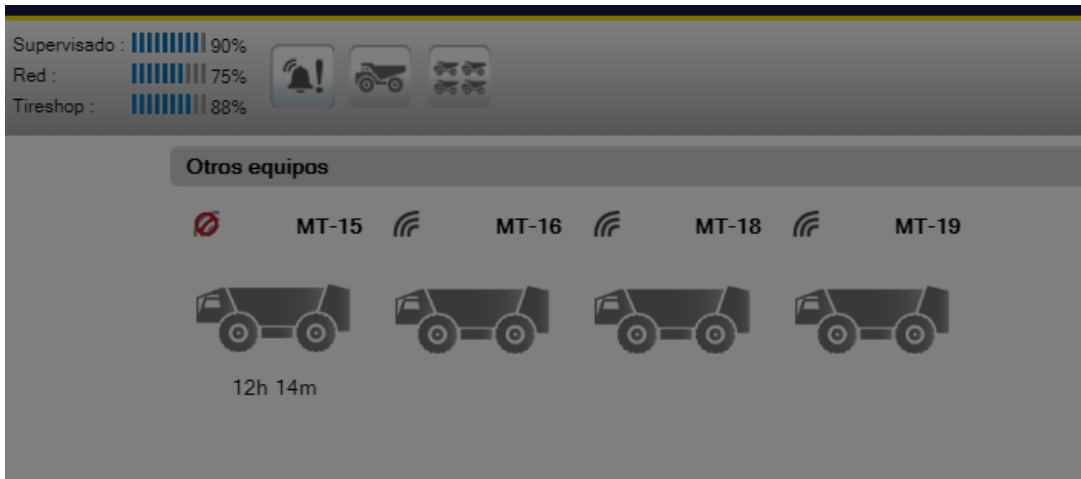
> Ejemplos de información extraíble..

- Estado del motor
- Horas del equipo en Stand-by
- Frenos
- Aceite
- Temperatura
- Niveles de combustible



Mantenimiento

Aumento Productividad



MT-16

Posición	Presión	Presión recomendada	Diferencia	Temperatura
1				
2	132 PSI	128 PSI	+4 PSI	61 °C
3	129 PSI	133 PSI	-4 PSI	56 °C
4	127 PSI	134 PSI	-7 PSI	58 °C



Mantenimiento

Infraestructura Comunicaciones

Infraestructura Comunicaciones

Robusta



Redundante



Escalable



Integrada



Plug & Play



Robusta

Bajo TCO

Menos
Mantenimiento

Resistente a

- agua,
- polvo,
- tronadura,
- golpes,
- y a las personas.



Redundante

Integridad y disponibilidad de data y energía.



Escalable

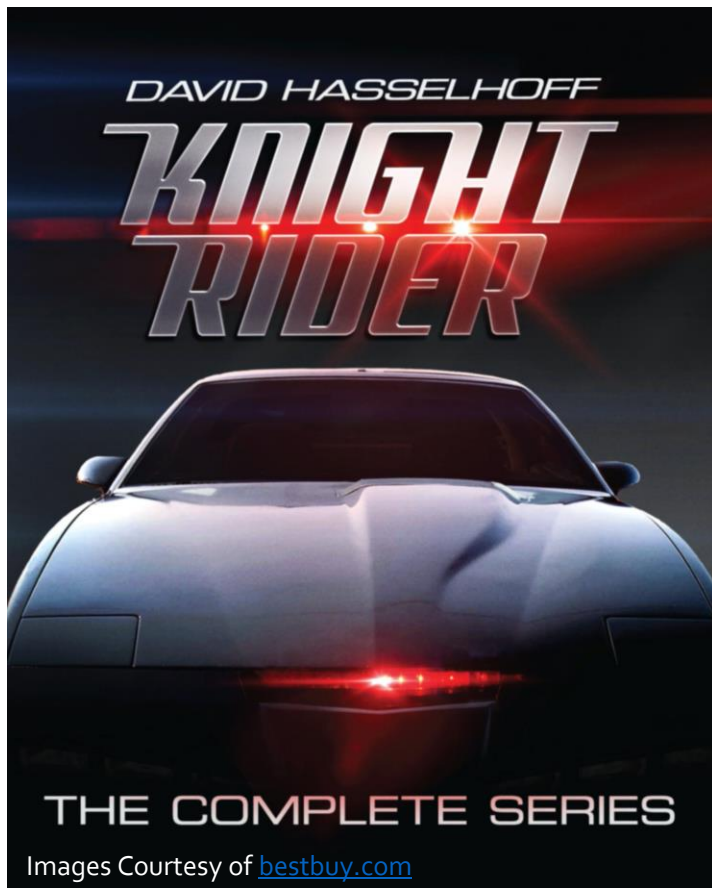
A prueba de futuro – Multiservicio - Inversión Segura



Escalable

A prueba de futuro – Multiservicio - Inversión Segura

• 1982

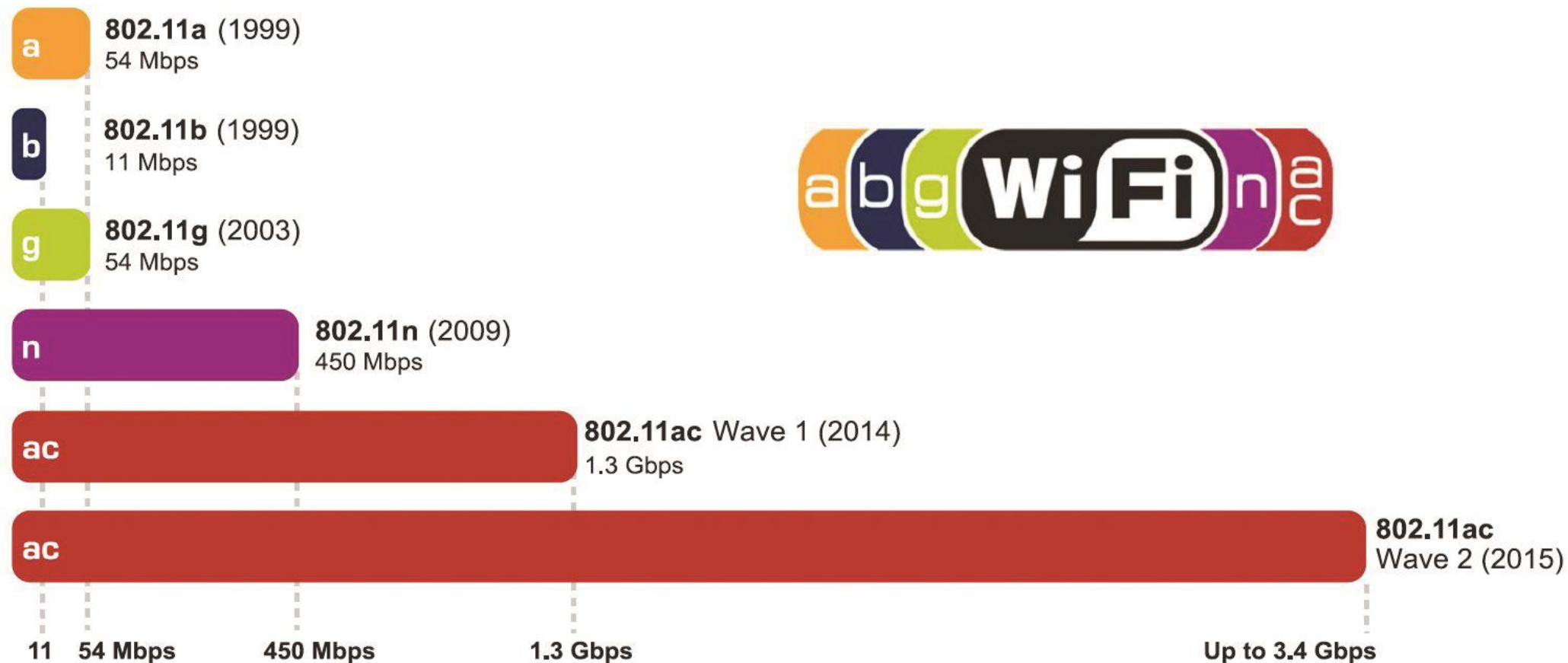


• 2019



Escalable

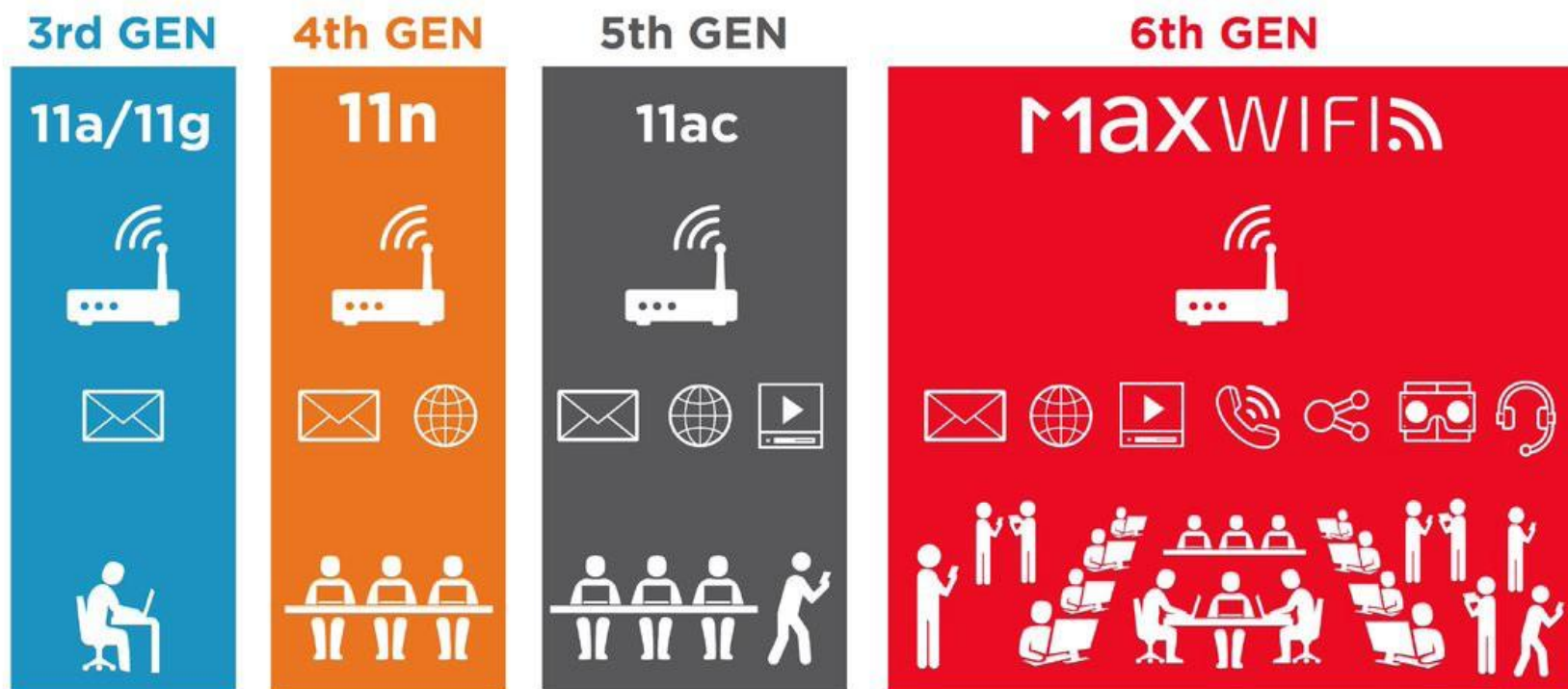
A prueba de futuro – Multiservicio - Inversión Segura



Escalable

A prueba de futuro – Multiservicio - Inversión Segura

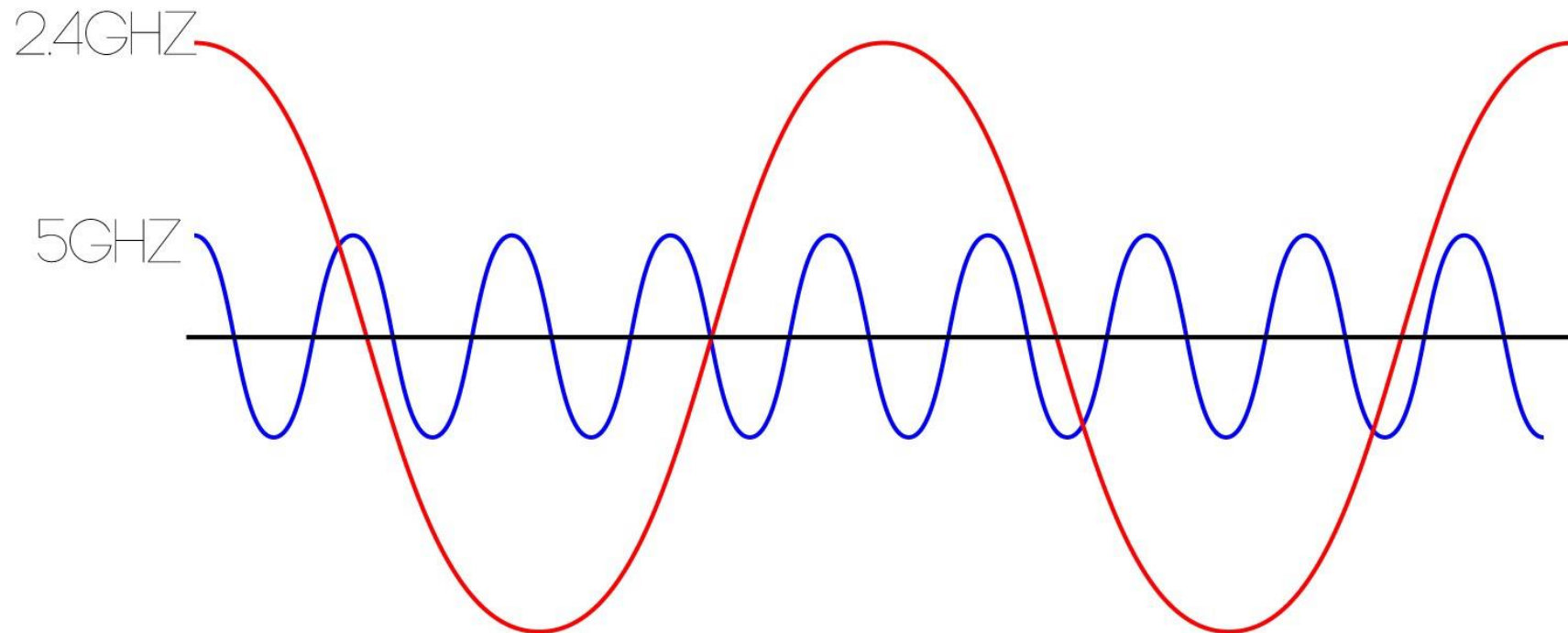
THE EVOLUTION OF WIFI



Escalable

A prueba de futuro – Multiservicio - Inversión Segura

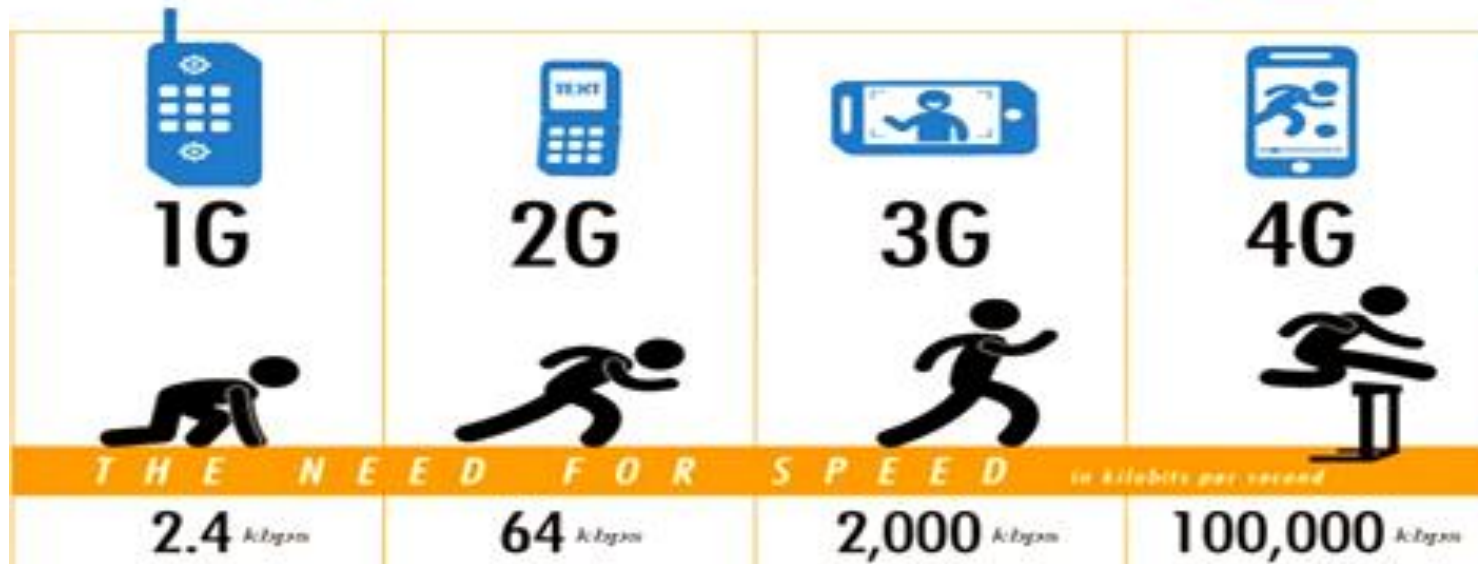
2.4GHZ AND 5GHZ WAVELENGTHS



Escalable

A prueba de futuro – Multiservicio - Inversión Segura

EVOLUTION OF THE G



Escalable

A prueba de futuro – Multiservicio - Inversión Segura



“5G is an umbrella term to describe a set of standards and technologies for a radically faster wireless internet that ideally is up to 20 times faster with 120 times less latency than 4G, setting the stage for IoT networking advances and support for new high-bandwidth applications.”

Quote and Image Courtesy of [Network World Magazine – April 2019](#)

Escalable

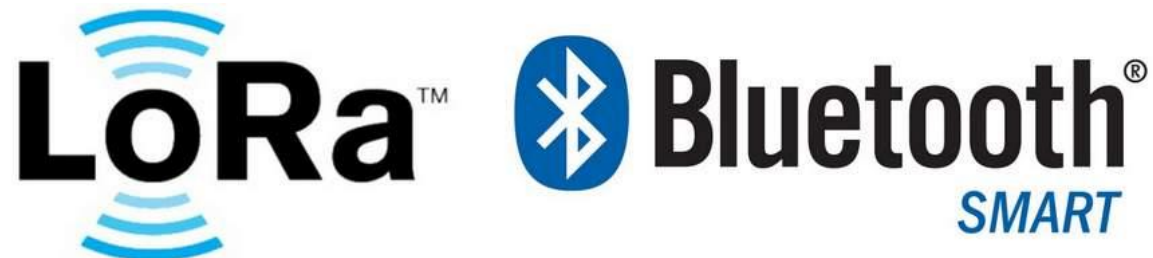
A prueba de futuro – Multiservicio - Inversión Segura



Image Courtesy of: cdn04.androidauthority.net/

Escalable

A prueba de futuro – Multiservicio - Inversión Segura



A GLOBAL INITIATIVE



ZigBee[®]

Integrada

Reutilización de sistemas existentes - Estándares abiertos.



Integrada

Reutilización de sistemas existentes - Estándares abiertos.

surface/underground ▾

All surface

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Foster Darrin		
Lalley David		
Buckley Douglas		
Savage Julian		
Hauden John		
Owendale Jacob		
GSRs Truck		
Baird Lee R.		
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All Underground

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Thompson Jason	Underground	01:09 PM, Today
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Kennedy Victor	Underground	01:10 PM, Today
Quiste Eric	Underground	12:39 PM, Today
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SSA	Underground	01:10 PM, Today
Olman Jason	Underground	12:16 PM, Today
Milford Randy	Underground	01:10 PM, Today
Hughes Adam	Underground	01:09 PM, Today
Powers Tom	Underground	01:09 PM, Today
Maintenance Spare 3	Underground	07:03 AM, 20/10/2017

Showing 1 - 20 out of 164

Vehicle Status ▾

All Vehicles Surface - Count: 22 All Vehicles Workshop - Count: 7 All Vehicles In Transit - Count: 60 Trip History Last 8h - All Vehicles - Count: 198

Parking Bay Camera Workshop Camera

All Vehicles Surface

LHT144	Maintenance Building
UTR083	Maintenance Building
UTR084	Maintenance Building
UFL028	Admin Building
LHT081	Admin Building
UFR008	Admin Building
UTR145	Admin Building
USL008	Maintenance Building
ULD054	Maintenance Building
UTR147	Admin Building
ULD065	Admin Building
LHT051	Admin Building
UJM043	Admin Building
UDR083	Admin Building
UTR073	Admin Building
UFR012	Maintenance Building
LHT082	Admin Building
UTR087	Admin Building
USL003	Maintenance Building
ULT007	Maintenance Building
UWT007	Maintenance Building
UTR146	Admin Building
UCR001	One Bin 2
UDR051	Turf 4180
UTR114	One Bin 2
LHT064	Turf 4200
ULD068	Turf 4180
UGR005	LV 4380
UFR009	LV 4315 Belts
UFL027	LV 4875
UW7012	LV 4490

All Vehicles Workshop

UDR050	4450 Mobile Shop
UFL023	4450 Mobile Shop
UTR113	4450 Mobile Shop
UTR136	4450 Mobile Shop
UTR093	4450 Mobile Shop
UTR072	4450 Mobile Shop
UGR004	4450 Mobile Shop

All Vehicles In Transit

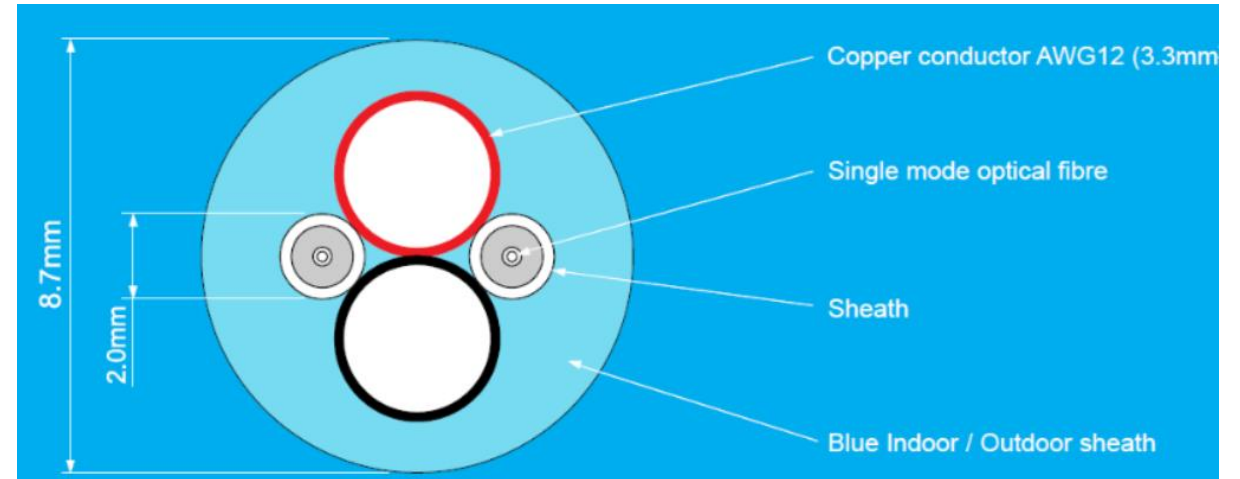
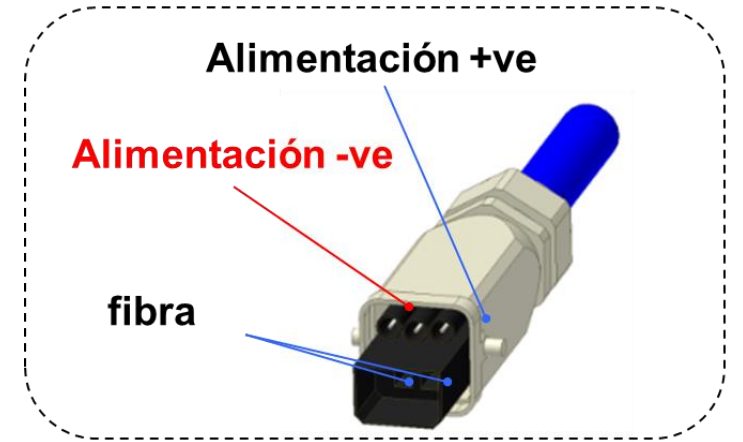
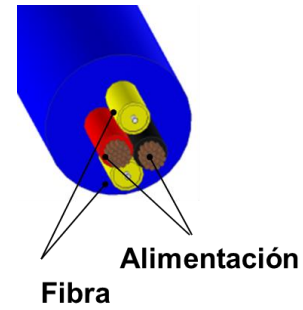
UTR083	LV 4900 Ramp
UTR084	LV 4380
UFL028	LV 4900 Ramp
LHT081	LV 4400
UFR008	LV 4450
UTR145	LV 4315 Belts
USL008	LV 4315 Belts
ULD054	LV 4490-95
UTR147	Full House
ULD065	LV 4450
LHT051	LV 4400
UJM043	LV 4359
UDR083	LV 4490-95
LHT051	LV 4450
UTR073	LV 4315 Belts
UJM043	LV 4359
UDR083	LV 4490-95
UTR073	LV 4315 Belts
UFR012	LV 4315 Belts
LHT082	LV 4400
UTR087	LV 4315 Belts
USL003	LV 4315 Belts
ULT007	LV 4450
UWT007	LV 4450
UTR146	LV 4450
UCR001	One Bin 2
UDR051	LV 4490-95
UTR114	LV 4315 Belts
LHT064	LV 4315 Belts
ULD068	LV 4510
UGR005	LV 4380
UFR009	LV 4315 Belts
UFL027	LV 4875
UW7012	LV 4490

Trip History Last 8h - All Vehicles

Name	Start Zone	End Zone	End Time
UTR083	LV Decline South R...	LV 4900 Ramp	11:24 PM, 23/5/2013
UTR084	LV Decline South R...	LV 4380	11:23 PM, 23/5/2013
UTR084	LV Decline South R...	LV 4380	11:23 PM, 23/5/2013
ULD054	LV Decline South R...	LV 4490-95	07:35 PM, 23/5/2013
UTR147	LV Decline South R...	Full House	06:54 PM, 18/6/2013
ULD065	LV Decline South R...	LV 4450	11:24 PM, 23/5/2013
LHT051	LV Decline South R...	LV 4400	11:10 PM, 23/5/2013
UJM043	LV Decline South R...	LV 4359	11:16 PM, 23/5/2013
UDR083	LV Decline South R...	LV 4490-95	11:20 PM, 23/5/2013
UTR073	LV Decline South R...	LV 4315 Belts	11:18 PM, 23/5/2013
UFR012	LV Decline South R...	LV 4315 Belts	09:42 PM, 23/5/2013
LHT082	LV Decline South R...	LV 4400	11:24 PM, 23/5/2013
UTR087	LV Decline South R...	LV 4315 Belts	11:16 PM, 23/5/2013
USL003	LV Decline South R...	LV 4315 Belts	11:15 PM, 23/5/2013
ULT007	LV Decline South R...	LV 4450	11:14 PM, 23/5/2013
UW7007	LV Decline South R...	LV 4450	10:12 PM, 23/5/2013
UTR146	LV Decline South R...	LV 4450	11:24 PM, 23/5/2013
UCR001	LV Decline South R...	One Bin 2	11:25 PM, 23/5/2013
UDR051	LV Decline South R...	LV 4490-95	03:45 AM, 22/5/2013
UTR144	LV Decline South R...	Turf 4180	07:51 AM, 23/5/2013
UTR114	LV Decline South R...	LV 4315 Belts	10:56 PM, 23/5/2013
LHT064	LV Decline South R...	Turf 4200	11:23 PM, 23/5/2013
ULD068	LV Decline South R...	LV 4510	09:29 PM, 23/5/2013
UGR005	LV Decline South R...	LV 4380	10:17 PM, 23/5/2013
UFR009	LV Decline South R...	LV 4315 Belts	11:22 PM, 23/5/2013
UFL027	LV Decline South R...	LV 4875	11:25 PM, 23/5/2013
UW7012	LV Decline South R...	LV 4490	11:12 PM, 23/5/2013

Plug & Play

Fácil de configurar y desplegar.



Soluciones disponibles

Redes de datos

Sistemas de radio

Telefonía

Vigilancia por video

Habilitación de máquinas autónomas

Telemetría de maquinarias móviles

Monitoreo ambiental

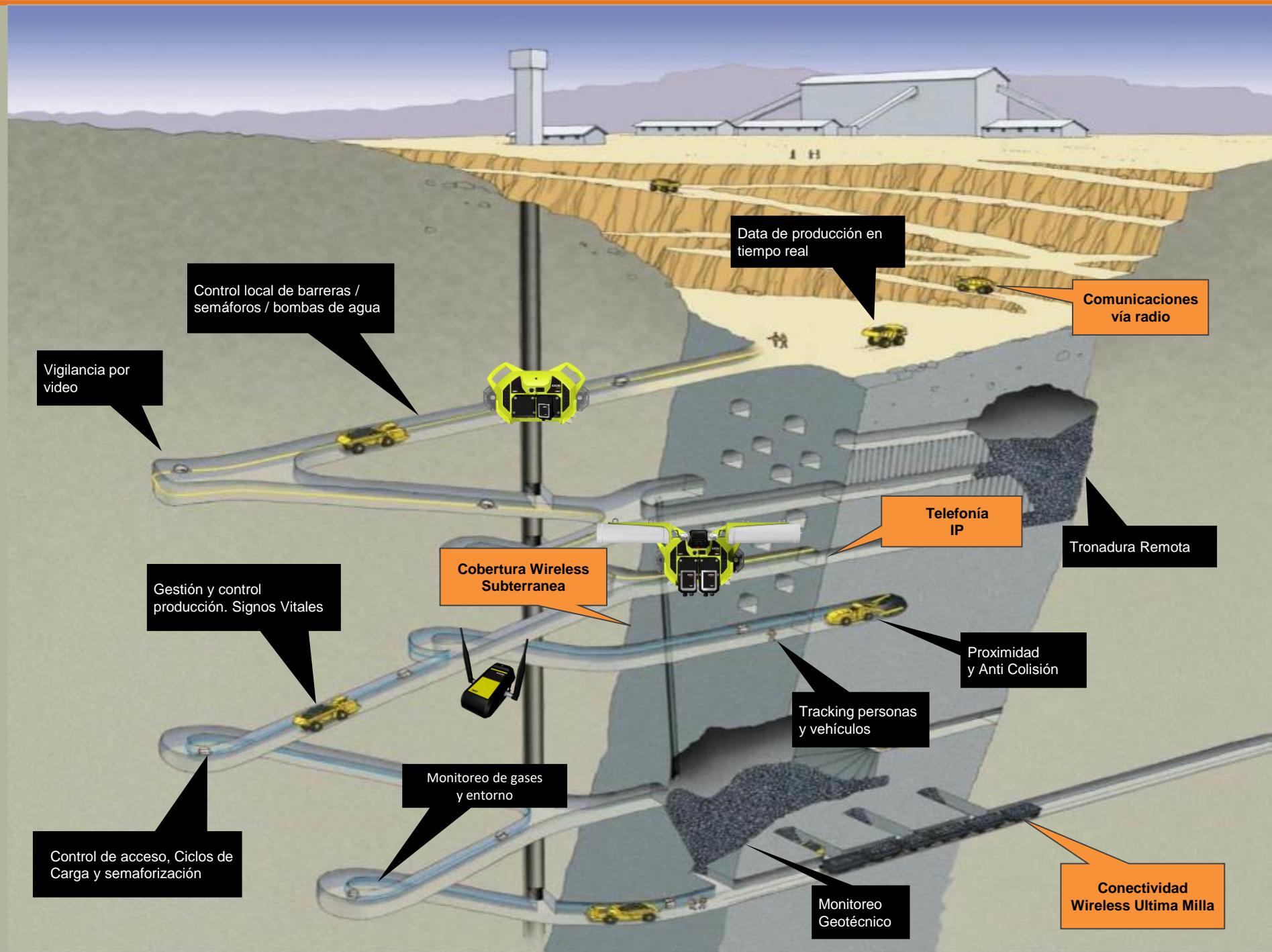
Detonaciones a distancia

Rastreo del personal y activos

Detección de proximidad

Mensajería de Emergencia

Gestión de producción.



Control local de barreras /
semáforos / bombas de agua

Vigilancia por
video

Data de producción en
tiempo real

Comunicaciones
vía radio

Cobertura Wireless
Subterránea

Gestión y control
producción. Signos Vitales

Telefonía
IP

Tronadura Remota

Proximidad
y Anti Colisión

Tracking personas
y vehículos

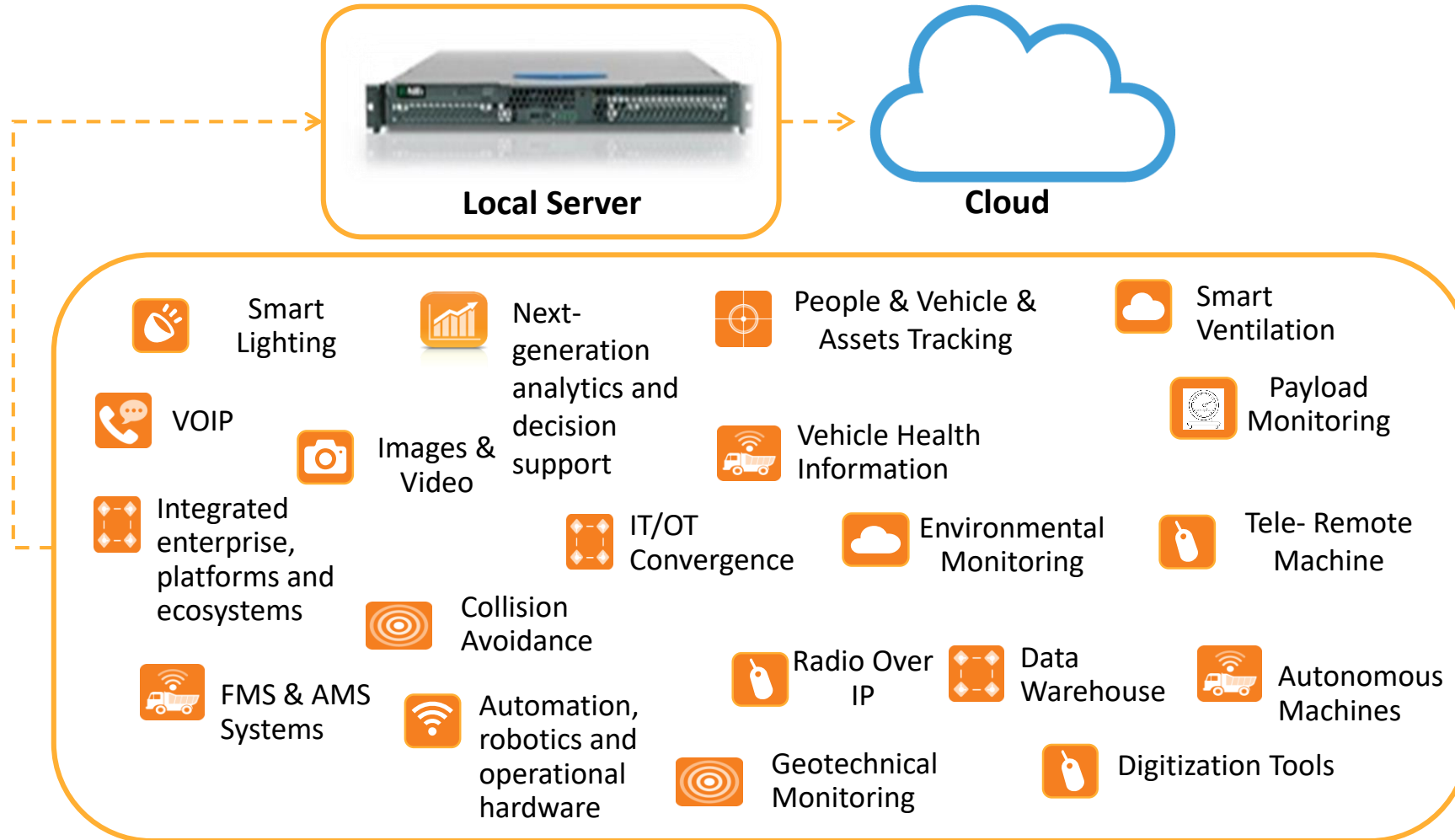
Monitoreo de gases
y entorno

Control de acceso, Ciclos de
Carga y semaforización

Monitoreo
Geotécnico

Conectividad
Wireless Ultima Milla

Soluciones disponibles



Casos aplicados

Casos aplicados

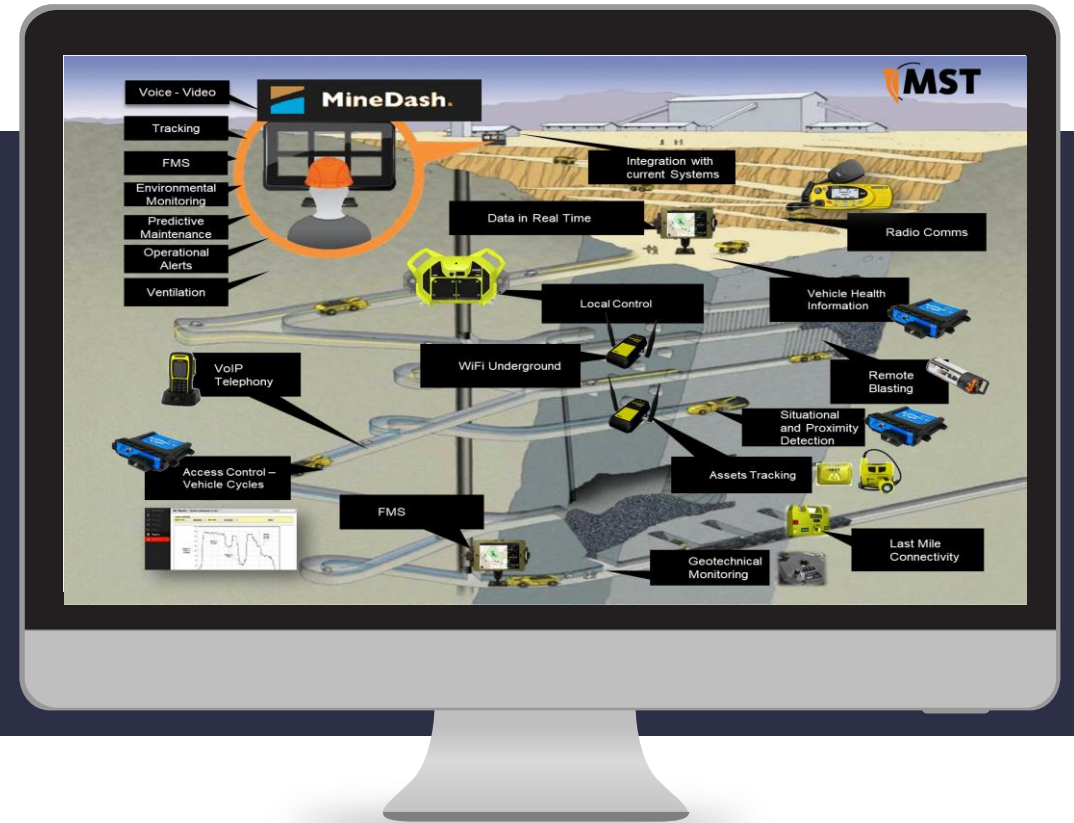
Verticales Claves a habilitar



Aumento de Seguridad



Aumento de Productividad



Aumento de seguridad

Algunas problemáticas en seguridad.

- ✓ Cuantas personas están en la operación y en que lugar?
- ✓ Todas las personas que ingresaron salieron al final del turno?
- ✓ Estamos trabajando de forma segura al interior de la obra?



Aumento de productividad

Algunas problemáticas en productividad.



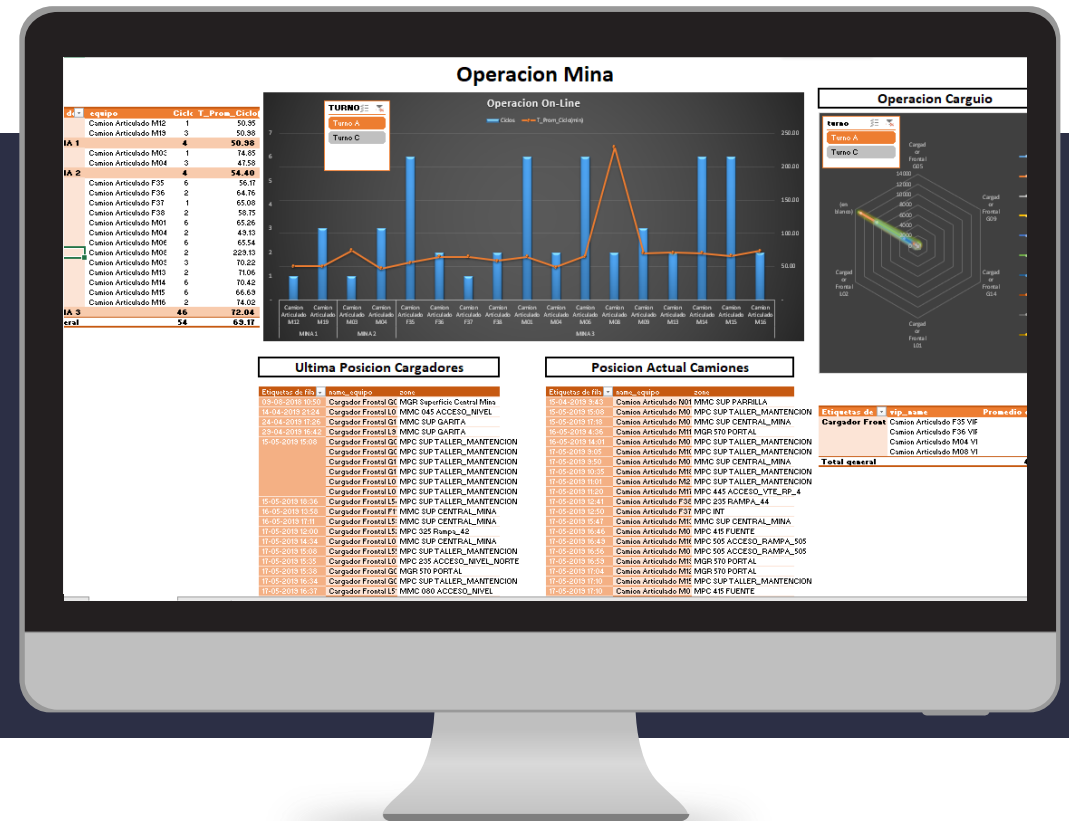
Estamos cumpliendo los targets definidos?



Tenemos cuellos de botella o vehículos detenidos debido a indisponibilidad en las áreas de trabajo?



Cuanto tiempo pasan mis activos en áreas de producción?



Aumento de productividad

Algunas problemáticas en mantención.



Cuanto tiempo mis activos pasan en mantenimiento?



Cuando va a fallar mi activo?



Puedo aumentar la vida útil de mi activo?



Contenidos

01

Rol Clave – Infraestructura Comunicaciones

02

Infraestructura comunicaciones

03

Soluciones disponibles

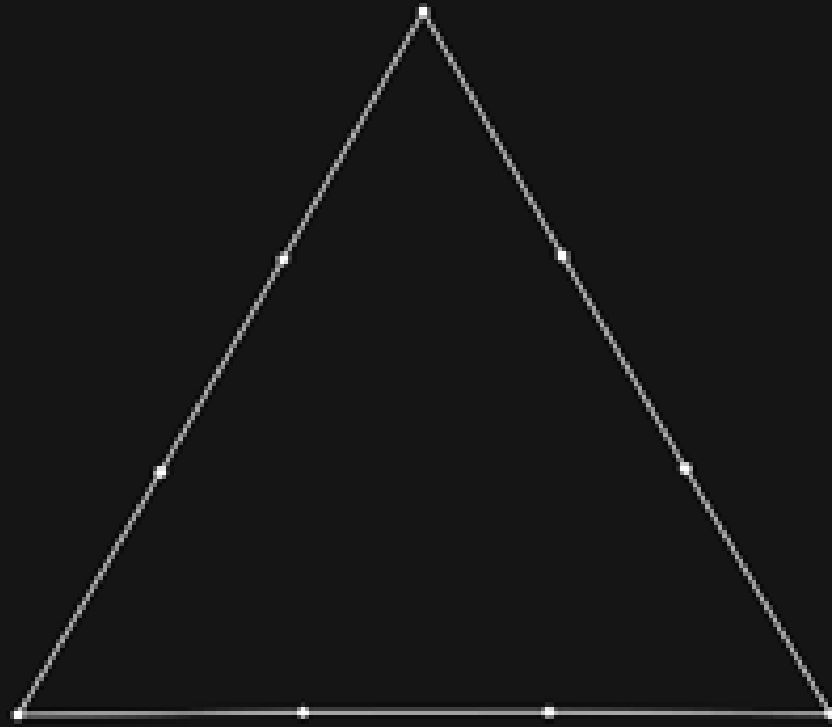
04

Casos aplicados

05

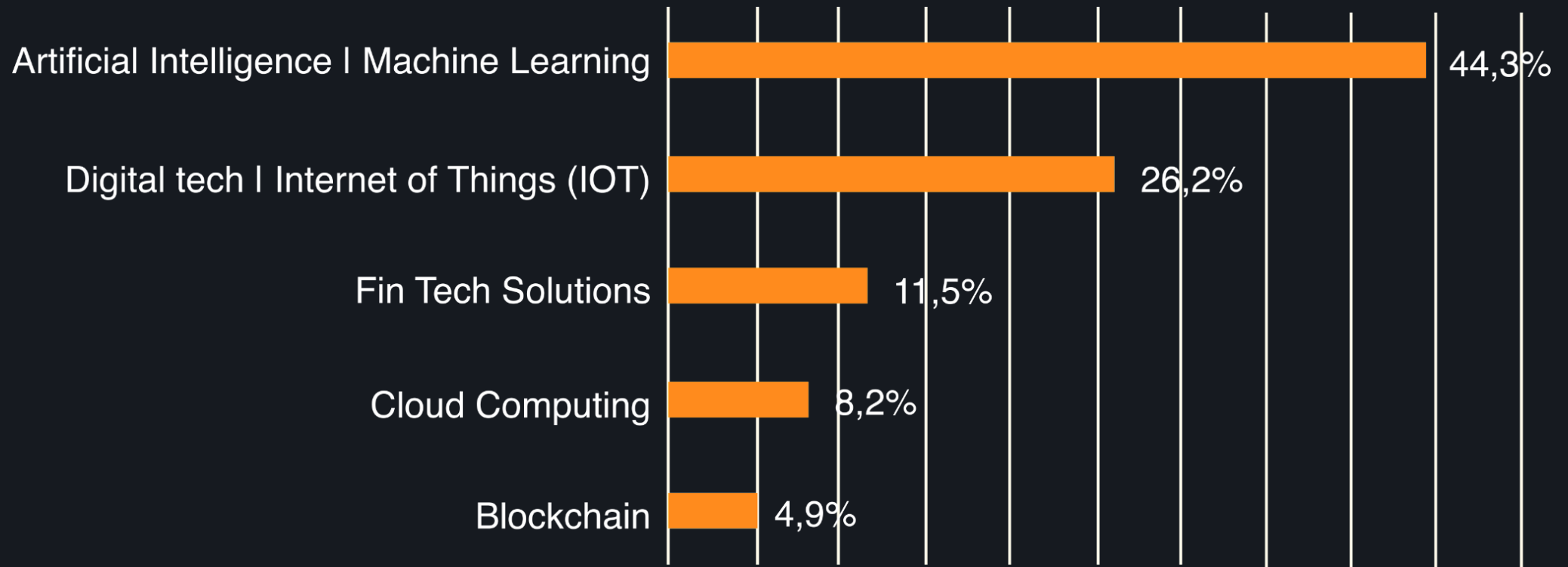
Disrupción





DIGITAL

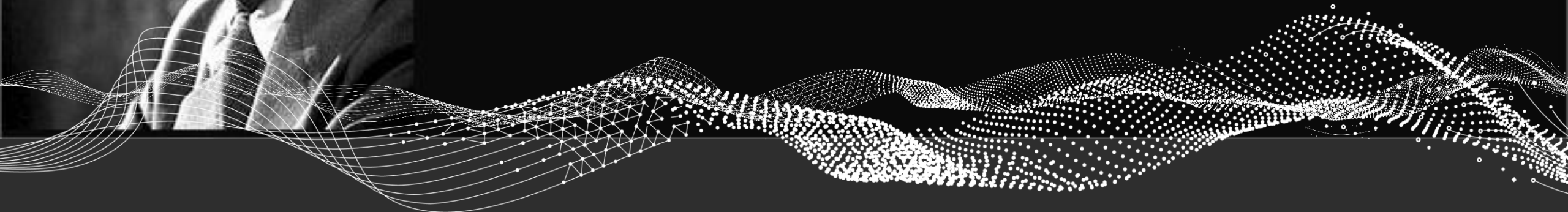
Tecnología más **disruptiva** de la **próxima década**





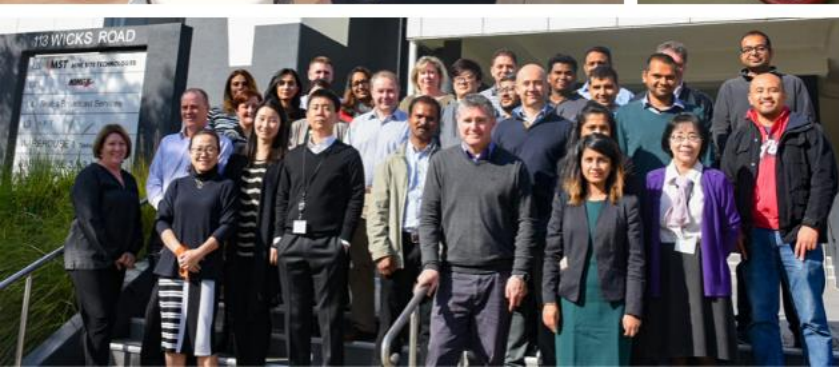
The human mind treats a new idea the same way
the body treats a strange protein; it rejects it.

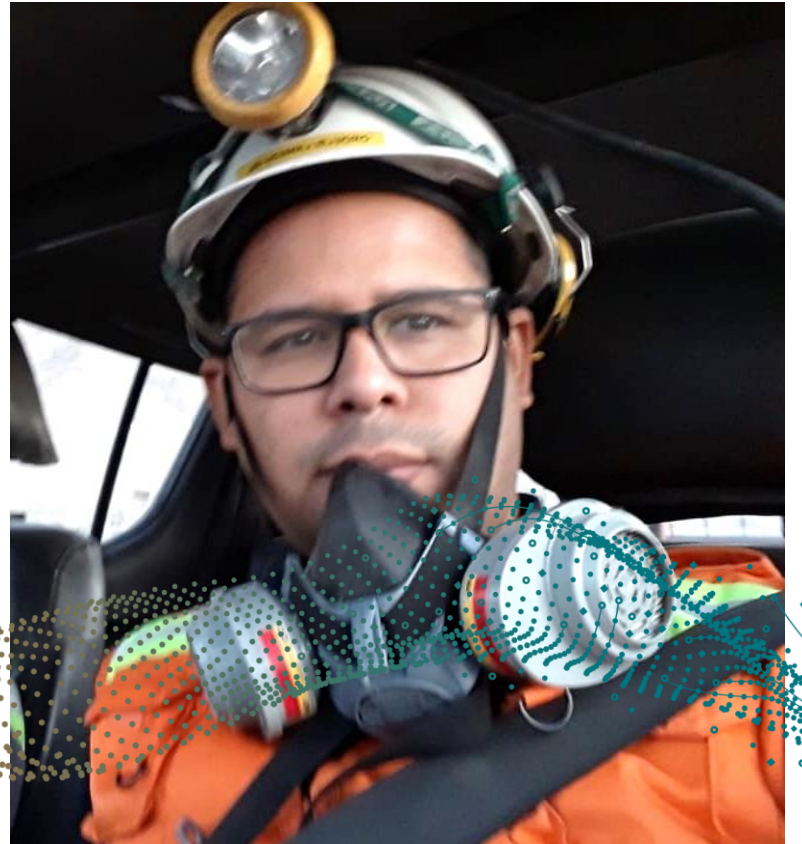
(Peter Medawar)





**Finalmente,
¿qué es lo más
importante?**







Conversemos...

Gabriel Ramirez V.

g.ramirez@mstglobal.com



Regional Manager LATAM

