

= Development of Grand Theft Auto V =

The development of Grand Theft Auto V began after Grand Theft Auto IV 's release in April 2008 . Rockstar Games published Grand Theft Auto V on 17 September 2013 for the PlayStation 3 and Xbox 360 , on 18 November 2014 for the PlayStation 4 and Xbox One , and on 14 April 2015 for Microsoft Windows , as the fifteenth entry in the Grand Theft Auto series . Their flagship Scottish studio Rockstar North oversaw the work , sharing it with other studios around the world . The development team considered the game a spiritual successor to many of their previous projects like Red Dead Redemption and Max Payne 3 . Grand Theft Auto V was unexpectedly announced in 2011 ; it was heavily promoted and widely anticipated .

Rockstar overhauled their proprietary Rockstar Advanced Game Engine ( RAGE ) to increase its draw distance rendering capabilities . The game uses the Euphoria and Bullet engines for further animation and environment rendering tasks . The developers tried to use all of the potential power of both the PlayStation 3 and Xbox 360 , having become familiar with the systems ' architectures over several years . The development team conducted extensive field research in Southern California while creating the game 's open world , set in and around Los Santos , a fictionalised depiction of Los Angeles .

Grand Theft Auto V is the first game in the series that allows players to control three protagonists , to distinguish the game from its predecessors and let players explore the open world with fewer constraints . The team used motion capture to record the facial and body movements of the characters . Like previous games in the series , Grand Theft Auto V has an in @-@ game radio that can tune into fifteen stations playing more than 241 tracks of licensed music , as well as two talk radio stations . The game also features an original score composed over many years by a team of five music producers .

= = Business = =

= = = Rumours and announcement = = =

During an earnings call in September 2009 , Take @-@ Two Interactive 's CEO Strauss Zelnick was asked about Grand Theft Auto V , the purported next game in the Grand Theft Auto series . He replied :

" We 're not going to announce it , we 're not going to announce when we are going to announce it , and we are not going to announce a strategy about announcing it or about when we are going to announce it either , or about the announcement strategy surrounding the announcement of the strategy . "

That November , vice president of Rockstar Games Dan Houser discussed with The Times his work on the series and the process that would be undertaken for the next Grand Theft Auto game . He expressed plans to co @-@ write a thousand @-@ page script and said that , when developing a new game , the company typically created a city and then from that developed the lead cast . In July 2010 , Rockstar North posted seven job advertisements related to a new title . The company wanted to recruit environment artists , physics programmers and character animators ? the latter advertisement asked for recruits with " professional experience developing a third person action game " . Some journalists wrote that the job listing was indicative of Grand Theft Auto V 's existence . In June 2011 , anonymous sources allegedly close to the developer told GameSpot that the title was " well under way " , with a release date likely in 2012 .

Rockstar Games first confirmed the game 's existence on 25 October 2011 in an announcement on its official website and Twitter feed . The share price of the publisher 's parent company Take @-@ Two Interactive subsequently increased seven percent . Journalists said that the announcement of Grand Theft Auto V ignited significant anticipation within the gaming industry , which they ascribed to the cultural significance of the Grand Theft Auto series .

== Promotion ==

The game was extensively marketed through video trailers and press demonstrations . On 3 November , a week after the game 's announcement , the debut trailer was released . It is narrated by one of the protagonists , Michael De Santa ( Ned Luke ) , and depicts the open world accompanied by the song " Ogdens ' Nut Gone Flake " by English rock band Small Faces . A press release published the same day confirmed that the game would be set in an open world recreation of Southern California ? including the city of Los Santos , a fictionalised depiction of Los Angeles . Almost a year later , Game Informer magazine ran a cover story on Grand Theft Auto V for their December 2012 issue . Rockstar intended to release the game 's second promotional trailer on 2 November . However , these plans were hampered by Hurricane Sandy , which cut power supplies to Rockstar 's New York offices . The trailer was eventually released on 14 November ; it introduces the lead protagonists ' back @-@ stories and features the song " Skeletons " by American musician Stevie Wonder .

To unveil the game 's cover art , Rockstar contracted artists to paint a mural on a wall in Manhattan , New York on 31 March 2013 , followed by the artwork 's digital release on 2 April . The artwork showed English model Shelby Welinder portraying a blonde beach @-@ goer . Three trailers were released on 26 April , each focusing on one of the game 's protagonists ? Michael De Santa , Franklin Clinton and Trevor Philips . The songs " Radio Ga Ga " by English band Queen , " Hood Gone Love It " by American rapper Jay Rock and " Are You Sure Hank Done It This Way " by American musician Waylon Jennings are used in the Michael , Franklin and Trevor trailers respectively .

A trailer released on 9 July 2013 features Grand Theft Auto V 's first gameplay footage . It demonstrates the shooting and driving mechanics and the player 's ability to instantaneously swap between characters . The game 's online multiplayer mode Grand Theft Auto Online was unveiled in a trailer released on 15 August . The video displayed activities from the mode , including bank heists , small robberies , " traditional " game modes , purchase of property and bicycle @-@ riding . The final pre @-@ launch trailer was released on 29 August ; it was intended to be a television advertisement . The song " Sleepwalking " by American band The Chain Gang of 1974 was used in this trailer .

Viral marketing strategies were used to promote the game . Visitors to the website of The Epsilon Program ? a fictional religious cult within the Grand Theft Auto universe ? were offered a chance to register for that group . After filling in an online membership form , the terms and conditions revealed that the site was a casting call for five people to appear in Grand Theft Auto V as members of the fictional cult . The official Grand Theft Auto V website was redesigned on 13 August 2013 to show a preview of activities and locales within the game 's world and an examination of the lead protagonists ' stories . More information was released on the website on 24 August , 6 September , and 13 September .

To encourage pre @-@ order sales , Rockstar collaborated with several retail outlets to provide special edition versions of the game . The " Special Edition " includes a unique case packaging , a game map and unlock codes for additional content in the single @-@ player and multiplayer modes . The publisher also collaborated with Sony to release a 500 GB PlayStation 3 console , which includes a copy of the game , a 30 @-@ day trial membership for the PlayStation Plus service and a set of Grand Theft Auto V @-@ branded headphones . All pre @-@ orders of the game granted the purchaser an access code for the Atomic Blimp , the in @-@ game aircraft . GameStop also held a promotional raffle for the game , wherein customers had a chance to win an actual Bravado Banshee sports car ( the game 's counterpart of the Dodge Viper ) . Rockstar collaborated with West Coast Customs to build the vehicle .

Shortly after the game 's release , an application called iFruit was released for iOS devices ; this allows players to customise vehicles , create custom license plates and teach Franklin 's dog Chop new tricks , which unlocks additional in @-@ game abilities . Upon its launch , some users reported problems connecting to the application 's servers ; these problems were resolved with an update on 25 September 2013 @-@ iFruit was released for Android on 29 October , and for Windows Phone

devices on 19 November .

== Delays and leak ==

Grand Theft Auto V did not meet its original projected release date of March ? May 2013 . By 30 October 2012 , promotional posters had spread to the Internet and a listing by the retailer Game had leaked the projected release date . Rockstar announced that day that the game 's release was scheduled for Q2 2013 , and the company began accepting pre @-@ orders on 5 November 2012 . On 31 January 2013 , the company announced the game 's release date had been postponed until 17 September of that year . " It simply needs a little more polish to be of the standard we and , more importantly , you require " , Rockstar stated in a press release . It was released in Japan on 10 October 2013 . The Microsoft Windows version , initially announced at E3 2014 as scheduled for simultaneous release with the PlayStation 4 and Xbox One versions , was delayed three times : first to 27 January 2015 , later to 24 March 2015 , and again to 14 April 2015 . According to Rockstar , the game required extra development time for " polishing " .

On 23 August 2013 , reports said that some European PlayStation 3 users who had pre @-@ ordered Grand Theft Auto V were able to download parts of the game , including its soundtrack and some character dialogue . Details of the game were leaked later that day and on following days before Sony removed the pre @-@ order file from the European PlayStation Network and released an official apology to Rockstar and its fans . In response , Rockstar stated it was " deeply disappointed by leaks and spoilers being spread in advance of the game 's launch " .

== Production ==

== Overview ==

Preliminary work on Grand Theft Auto V began on Microsoft Windows , PlayStation 3 and Xbox 360 , shortly after the release of Grand Theft Auto IV in April 2008 , but later gave way to focus more on the consoles before returning greater focus to the PlayStation 4 , Xbox One and Windows versions . Rockstar North , the core 360 @-@ person team behind the game , co @-@ opted studios owned by parent company Rockstar Games to facilitate development between a full team of over 1 @, @ 000 . These included Rockstar NYC , Rockstar San Diego , Rockstar Leeds , Rockstar Toronto , Rockstar New England , Rockstar London and Rockstar Lincoln . Technical director Adam Fowler said that , while development was shared between studios in different countries , the process involved close collaboration between the core team and others . This was necessary because many mechanics in the game work in tandem , which would have created difficulties if studios did not communicate with each other .

Like other projects since Rockstar Games Presents Table Tennis ( 2006 ) , the game uses the proprietary Rockstar Advanced Game Engine ( RAGE ) to perform animation and rendering tasks , and the Euphoria and Bullet engines for further animation and environment rendering tasks . By 25 August 2013 , development of Grand Theft Auto V stopped as the game was submitted for manufacturing . Media analyst Arvind Bhatia estimated the development budget for the game exceeded US \$ 137 million , and The Scotsman reporter Marty McLaughlin estimated that the combined budget of the development and marketing efforts exceeded GB £ 170 million ( US \$ 265 million ) , making Grand Theft Auto V the most expensive video game ever made .

The team found they could render the game world with greater detail than in Grand Theft Auto IV because they had become familiar with the PlayStation 3 and Xbox 360 's hardware . Art director Aaron Garbut said that while the ageing hardware of the PlayStation 3 and Xbox 360 were tiring to work with , the team were able to render lighting and shadows in detail while " maintain [ ing ] a consistent look " . Vice president Dan Houser agreed with this statement and felt that working on Grand Theft Auto IV with relatively new hardware was difficult , but added , " now we know what the hardware 's capable of , so it 's become a lot easier to move things along and a lot more fun , too " .

The PlayStation 3 , PlayStation 4 and Xbox One versions fit onto one Blu-ray Disc ; Xbox 360 copies of the game are distributed on two DVD discs and require an 8 GB installation on the HDD or external storage device ; while the Microsoft Windows version takes up seven DVD disks . The team asserted that any differences between the PlayStation 3 and Xbox 360 versions would be negligible .

== Design goals ==

Grand Theft Auto V was envisioned to improve the core mechanics of the Grand Theft Auto series by giving the player three lead protagonists to switch between . The team 's main motivation for including three protagonists was for Grand Theft Auto V to innovate game storytelling and to prevent the series from feeling stale by not evolving the core structure of the gameplay . Houser said , " We didn 't want to do the same thing over again " . The concept of having three interconnected protagonists was devised during the development of San Andreas , but the team felt they did not have the technical capabilities to realise it . Garbut explained , " It didn 't work from a tech point of view because the three characters need three times as much memory , three types of animation , and so on " . After the release of Grand Theft Auto IV , the team developed episodic content packages , The Lost and Damned and The Ballad of Gay Tony ( both 2009 ) , each of which introduced a new protagonist . The three interwoven stories had a positive critical reception and confirmed the team 's confidence that building Grand Theft Auto V around this model was an innovative decision .

A single player story revolving around three lead protagonists was one of Grand Theft Auto V 's earliest design objectives . Garbut felt that such a radical change to the gameplay 's core structure was a risk , recalling the team 's concern that a departure from Grand Theft Auto 's traditional , single lead character set up " might backfire " . In early conceptualisations , the game would have told three stories ; each through a different protagonist . Later , a concept that story trajectories would meet throughout the game was developed from the stories of Grand Theft Auto IV . Eventually , the concept evolved into three interconnected stories that intertwined through the game missions . According to Benzies , the team made the multiple character formula " integral to the structure of the gameplay as well as the narrative " . Houser opined that Grand Theft Auto V is their " strongest plotted game because the characters are so intertwined " and that the " meeting points [ between the character 's stories ] are very exciting " .

Grand Theft Auto V 's central story theme is the " pursuit of the almighty dollar " . Mission content is structured around the lead characters ' efforts to plan and execute complicated heists to accrue wealth for themselves . The team decided to focus on money as the game 's central theme in response to the 2007–08 financial crisis ; the effects of the crisis on the main characters are the catalyst for them to conduct heist missions . Houser explained , " We wanted this post-crash feeling , because it works thematically in this game about bank robbers " . The team were encouraged by the positive reaction to the " Three Leaf Clover " mission in Grand Theft Auto IV in which an elaborate heist is coordinated and executed by the lead protagonist Niko Bellic and accomplices to develop the story around the heists . Houser said that while the " Three Leaf Clover " mission was well received , the team had not captured the thrill of the robbery sequence to the best of their capabilities and wanted to focus on achieving that in Grand Theft Auto V. He explained , " We wanted to have a couple of really strong bank robberies ... It felt like that was a good device that we 'd never used in the past . Repeating ourselves is a fear when we 're doing games where part of the evolution is just technological " .

== Research and open world design ==

Initial work on Grand Theft Auto V involved designing the open world space ; preliminary models of the world were constructed during the game 's pre-production phase . The open world of the game is the fictional U.S. state of San Andreas , which includes the city of Los Santos . San Andreas was also used as the setting of Grand Theft Auto : San Andreas ( 2004 ) , which included

three cities separated by open countryside . The team thought that the ambition of including three cities in Grand Theft Auto : San Andreas was too great and that the game did not emulate the cities as well as they had hoped . Los Angeles was used as the model for Los Santos in both games ; Houser felt that " to do a proper version of L.A. ... the game has to give you a sense of that sprawl ? if not completely replicate it " , and that dividing the budget and manpower between multiple cities would have detracted from capturing " what L.A. is " . Garbut said that in the PlayStation 2 era , the team did not have the technical capabilities to capture Los Angeles properly , resulting in the San Andreas rendition of Los Santos feeling like a " backdrop or a game level with pedestrians randomly milling about " . The team disregarded San Andreas as a departure point for Grand Theft Auto V because they had moved on to a new generation of consoles and wanted to build the city from scratch . According to Garbut , with the move to the PlayStation 3 and Xbox 360 hardware , " our processes and the fidelity of the world [ had ] evolved so much from San Andreas " that using it as a model would have been redundant . The team focused their efforts on one city instead of three and were able to produce Los Santos in higher quality and at greater scale than in the previous game .

Los Angeles was extensively researched for the game . The team organised field research trips with tour guides and architectural historians , and captured around 250 @, @ 000 photographs and many hours of video footage . Houser said , " We spoke to FBI agents that have been undercover , experts in the Mafia , street gangsters who know the slang ? we even went to see a proper prison " . Houser considered the research and creation of the game world to be the most demanding aspects of the game 's production . The team viewed Google Maps and Google Street View projections of Los Angeles ; the field research team then used the coordinates to capture the photographs and video footage , which were used to design the layout of Los Santos . The team also studied virtual globe models of the city , census data and documentaries to recreate the geographical and demographic spread of Los Angeles . Reproducing Los Angeles as a play space required the team to condense the city 's spread into an area that the player could comfortably traverse ; according to Houser , they captured " the essence of what 's really there in a city , but in a far smaller area " . Sam Sweet of The New Yorker said , " [ The ] exhaustive field work ... wasn 't conducted to document a living space . Rather , it was collected to create an extremely realistic version of a Los Angeles that doesn 't actually exist . The map of Los Santos is familiar but its contents are condensed " . Garbut said the team were not " dictated by reality " when designing the city and instead used Los Angeles as a starting point for the city 's design .

Research for the game took the team to California 's rural regions ; Garbut recalled a visit he took with Houser to Bombay Beach , which inspired them to set Trevor 's initial story against a recreation of the Salton Sea , known as " Sandy Shores " in the game . The team made an open recreation of Southern California which includes vast tracts of countryside around the city proper . They wanted to create a large world without open , empty spaces . The team focused on condensing the countryside of Southern California into a diverse and detailed playing space . The game world covers 49 square miles ( 130 km<sup>2</sup> ) ? about an eightieth of Los Angeles County . It is greater in scale than Rockstar 's previous open world games ; Garbut said it is large enough to fit the game maps of San Andreas , Grand Theft Auto IV and Red Dead Redemption ( 2010 ) combined inside . To accommodate the size of the world , the team overhauled the RAGE , allowing the game to render greater draw distances than in previous Grand Theft Auto games . The large , open space necessitated the re @-@ introduction of fixed @-@ wing aircraft , which had been absent in Grand Theft Auto IV because of the relatively small scale of the world . Houser explained , " We wanted somewhere big [ to allow the player to ] fly properly " . The large space demanded populating the open world with wildlife ; lead producer Leslie Benzies felt that " because of the scale of the map and the different kinds of areas involved , a countryside without animals would feel quite hollow " .

= = = Gameplay design = = =

The development team found that introducing three concurrent protagonists increased the freedom afforded to players in missions . Lead mission designer Imran Sarwar felt that having multiple protagonists allowed different strategic options to open up in missions . He said that in a combat

scenario the player can set up Michael at a high vantage point with a sniper rifle to provide covering fire for Trevor , who provides a frontal assault on the enemy position , allowing Franklin to manipulate flank points . Benzies said that character @-@ switching would eliminate a problem the team felt San Andreas had ; the player would be exploring open countryside and would then need to drive a long distance to a mission start point . In Grand Theft Auto V , the interplay of free roaming and mission gameplay is more organic because the player can switch between characters . According to Benzies , " Having three characters allows players to explore the whole map without having to worry about the long drive back to their next objective " . Houser commented that the use of multiple characters could remove dead spots in missions , for example where a character has to drive to a meeting point , because the player can switch to another character and be pulled into the action of the game more quickly . The game includes dynamic mission content , a feature borrowed from Red Dead Redemption because of its positive reception in that game . Dynamic missions present themselves to the player while exploring the game world ; the player can choose to either accept or ignore them . The team developed the concept of dynamic mission content further in Grand Theft Auto V by delivering it in the open sections of the world and in Los Santos ; for example , the player can encounter an armoured van in the city and try to intercept it to steal its contents .

To reflect the advances made in other games since the release of Grand Theft Auto IV , the team overhauled many of the shooting and driving mechanics for Grand Theft Auto V. The public reception of the shooting mechanics of the team 's previous games were considered during this process . Grand Theft Auto IV , Red Dead Redemption and Max Payne 3 ( 2012 ) were scrutinised to establish which areas needed work in Grand Theft Auto V to make it surpass previous titles . To increase the pace of shootouts , the team removed hard locking ? a central mechanic in Grand Theft Auto IV ? that allows players to instantly lock on to enemies near their crosshair . Associate technical director Phil Hooker noted that the team " found [ hard locking ] too disorientating and often broke your immersion with the game , as you didn 't have to think about enemy locations " . Hooker said the team introduced a timer that breaks the player 's lock on a target after a certain time to combat the problem with Grand Theft Auto IV , in which the player can " just rely on holding and shooting until a target is dead " . Another natural progression was reworking the cover system in combat gameplay , which was remodelled on the cover system of Red Dead Redemption ; entering and exiting cover such as low walls and vehicles is more fluid in Grand Theft Auto V than in earlier games in the series . The team also reworked the driving mechanics for cars and motorcycles . Houser felt that the cars would handle better than they did in Grand Theft Auto IV , which he thought were " big and boat @-@ like " , whereas in Grand Theft Auto V the cars handle similarly to those in racing games .

= = = Character development = = =

The team drew upon game protagonist archetypes during the scripting of the characters . Michael was considered to embody greed , Franklin ambition and Trevor insanity . Houser felt the team characterised Michael and Trevor as juxtapositions of each other . He said , " Michael is like the criminal who wants to compartmentalise and be a good guy some of the time and Trevor is the maniac who isn 't a hypocrite " . He considered that having three lead characters would help move Grand Theft Auto V 's story into more original territory than its predecessors , which traditionally followed a single protagonist rising through the ranks of a criminal underworld . Ned Luke portrayed Michael , Shawn " Solo " Fonteno portrayed Franklin and Steven Ogg portrayed Trevor . Fonteno first became aware of the acting job through his friend DJ Pooh , who worked on San Andreas and was involved in Grand Theft Auto V 's music production . When Luke 's agent advised him of the casting call for Grand Theft Auto V , he initially did not want to audition for the part because it was in a video game . After reading the audition material and learning more about the project , Luke became interested in auditioning . He reflected , " I went immediately after reading the material from ' I 'm not doing it ' to ' nobody else is doing it ' . It was just brilliant " . During the initial audition process , Ogg noticed an on @-@ set chemistry between him and Luke , which he felt helped secure them the roles . Ogg explained , " When [ Luke ] and I went in the room together we

immediately had something ". While the actors knew their auditions were for Rockstar Games , it was not until they signed contracts that they learnt they would be involved in a Grand Theft Auto title .

The actors began working on the game in 2010 . Their performances were mostly recorded using motion capture technology . Dialogue for scenes with characters seated in vehicles was recorded in studios . Because the actors had their dialogue and movements recorded on @-@ set , they found their performances no different to those of film or television roles . Their dialogue was scripted so that it did not allow the actors to ad @-@ lib ; however they sometimes made small changes to the performance with approval from the directors . To prepare for his role as Michael , Luke gained 25 pounds and studied Rockstar 's previous games , starting with Grand Theft Auto IV . Luke considers Michael 's characterisation to be an amalgamation of Hugh Beaumont 's portrayal of Ward Cleaver in the American sitcom Leave It to Beaver ( 1957 ? 63 ) and Al Pacino 's portrayal of Tony Montana in the 1983 film Scarface .

Ogg felt Trevor 's characterisation had evolved over time . He said , " Nuances and character traits that began to appear ? his walk , his manner of speech , his reactions , definitely informed his development throughout the game " . Ogg cites Tom Hardy 's depiction of English criminal Charles Bronson in the 2008 biopic Bronson as a strong stylistic influence on his portrayal of Trevor . Ogg opined that while Trevor embodies the violent , psychopathic Grand Theft Auto anti @-@ hero archetype , he wanted players to sympathise with Trevor 's story . " To elicit other emotions was tough , and it was the biggest challenge and it 's something that meant a lot to me " , Ogg explained . Fonteno felt that growing up in South Los Angeles and being exposed to gang culture helped him connect to the character of Franklin . He drew upon his earlier involvement with a gang and trafficking drugs in his portrayal of Franklin . " I lived his life before ... He 's been surrounded by drugs , the crime , living with his aunt ? I lived with my grandmother ? so there was a lot of familiarity " , Fonteno said . Having not worked as an actor since portraying Face in the 2001 film The Wash , Fonteno sought counsel from Luke and Ogg to refine his acting skills .

= = = Re @-@ release = = =

Development of the Microsoft Windows version of the game began in parallel with the PlayStation 3 and Xbox 360 versions . At E3 2014 , a re @-@ release of the game was announced for Windows , PlayStation 4 and Xbox One . This enhanced version of the game features an increased draw distance , finer texture details , denser traffic , upgraded weather effects , and new wildlife and vegetation , as well as a new on @-@ foot first @-@ person view option . Animation director Rob Nelson said that a first @-@ person option was raised during development on the PlayStation 3 and Xbox 360 , but that the consoles ' relatively smaller banks of memory were already being pushed , such that adding new first @-@ person animations would have inhibited the open world render . According to Nelson , the first @-@ person view required more development effort than simply repositioning the camera , because of the need to adapt combat to a different view . The weapons were upgraded to a higher resolution , and new animations including weapon recoil , reload and switch were added . " I think we created 3 @,@ 000 animations on weapons alone " , said Nelson . The re @-@ release features more than 100 new songs across the game 's radio stations . Players may transfer characters and progression of Grand Theft Auto Online between some platforms and gain exclusive content .

Art director Aaron Garbut said that the enhanced version 's graphical upgrade came largely from the addition of first @-@ person . Remodelled cars feature interior effects including functional speedometers , fuel gauges and dashboard handbrake lights . The team added new particle and lighting effects , " like fireflies at night in the countryside , or ambient light pollution over Los Santos at night " , according to Garbut . Red Dead Redemption ( 2010 ) inspired the team to add more vegetation to " break up the hard edges [ and ] straight lines " of the open world . The original version 's vegetation was replaced with more detailed equivalents in the enhanced version . An upgraded weather system lets tree branches and leaves blow realistically in the wind . The team hand placed weeds along fences and walls , and placed grass over many of the open world 's

terrains . They then layered flowers , plants , stones , leaves and litter over the grass . An upgraded screen space ambient occlusion system renders dynamic shadows that may cast through weather effects including volumetric fog , and particle effects including light reflections in water bodies or neon reflections in cars at night . The ambient light pollution over nighttime Los Santos may dissipate in poor weather . A dynamic depth of field system sharpens and softens images to emulate camera autofocus , and improved shaders produce new colours in skin and terrain textures .

= = = Music production = = =

Grand Theft Auto V is the first game in the series to use an original score . Music supervisor Ivan Pavlovich commented that creating the score was " daunting " because it would be unprecedented for a Grand Theft Auto game . Like most previous games in the series , Grand Theft Auto V also contains licensed music tracks provided by an in @-@ game radio . Pavlovich said the team did not want the original music to detract from the use of licensed music , but rather to accompany it . To work on the score , Rockstar engaged The Alchemist , Oh No and Tangerine Dream with Woody Jackson , who had collaborated with the team on Red Dead Redemption , L.A. Noire ( 2011 ) and Max Payne 3 . In collaboration with each other , the team of producers composed twenty hours of music which scores the game 's missions . In addition , music plays dynamically throughout the game in both the single @-@ player and multiplayer modes . Pavlovich felt that at times , Rockstar gave the team missions to score but that some of the team 's music composed for no specific purpose influenced other missions and provided inspiration for further score development . He described a " stem @-@ based " system that was used to make the music fit dynamic factors in the game ; after a piece of music was assigned to a particular mission , the team composed music to underscore outcomes the player could make after completing it .

Early in the game 's development , the music team were shown an early build of the game before working on the score . Their work was mostly complete later in the game 's development but they continued composing until the final build of the game had to be submitted for manufacturing . Edgar Froese , Tangerine Dream 's founding member , was not initially interested in being involved in producing music for the game . After he was flown to the studio and shown Grand Theft Auto V , he was impressed by the game 's scale and cinematic nature , and changed his mind . Froese 's first eight months of work on the score produced 62 hours of music . He recorded with Tangerine Dream in Austria but further work was conducted at Jackson 's studio in the United States , which The Alchemist and Oh No also used . Jackson learnt that the composers would be building on each other 's work and expressed concern that the finished product could be disjointed . His initially provided score for Trevor 's missions , citing The Mars Volta and Queens of the Stone Age as stylistic influences . After sending his work to the other members of the team , Jackson was impressed by Froese 's contributions to his work . " Edgar evolved the music , made it into a whole other thing " , he said . Froese had taken Jackson 's hip hop @-@ influenced work and interpolated it with a funk sound . Froese and Jackson also sent their work between The Alchemist and Oh No , who heavily sampled their work . The Alchemist opined , " We were sampling , taking a piece from here , a piece from there ... We pitched stuff up , chopped it , tweaked it . Then we chose the tracks that worked and everyone came in and layered on that " . DJ Shadow then mixed the team 's creations together and matched it to the gameplay .

In developing the radio stations , the Rockstar team wanted to reinforce the game 's recreation of California by licensing tracks they felt imparted an appropriate " Cali feel " . About the inclusion of the pop station Non @-@ Stop @-@ Pop FM , Pavlovich said that " the first time you get off an airplane in L.A. and you hear the radio and the pop just seeps out ... We wanted that . It really connects you to the world " . He felt that licensing music for the game involved a greater discernment than in Grand Theft Auto IV because the music in Grand Theft Auto V played a greater role in generating a Californian atmosphere . Pavlovich said , " It reflects the environment in which the game is set " . Initially , the team planned to license over 900 tracks for the radio but they refined the number to 241 . The tracks are shared between fifteen stations ; the radio also includes two talk @-@ back stations and a radio station for custom audio files on the Windows version . Some of the



tracks were written specifically for the game ; for example , rapper and producer Flying Lotus hosts the station FlyLo FM , which includes original work he composed for the game . Pavlovich commented that for each radio station , the team would develop an understanding of where the station 's music was going and select a DJ to host it . Each station 's DJ was selected to match the genre of music the station hosts ; in developing Los Santos Rock Radio the team licensed classic rock tracks and chose Kenny Loggins as the station 's DJ . Pavlovich felt that striking a balance between the radio and the score was a meticulous process . He cited a mission template as an example in which the player would drive to an objective while listening to the radio ; the score would begin once the player left the vehicle and moved into the next stage of the mission .