

Exhibit C-26: TERM Parameters

Parameter	Description/Purpose	Current Value(s)	Location [Field or Variable Name]	Data Source(s) (Date)
Unit Cost	· Unit cost values for the over 600 asset types recognized by TERM. TERM uses these values to determine the acquisition costs, replacement costs, and rehabilitation costs of individual transit assets listed in TERM's national asset inventory. Note that this unit cost is only used for asset data obtained from the National Transit Inventory (NTD) Asset Inventory Module (AIM). TERM uses actual asset unit costs for those asset records provided to FTA by owner agencies (in response to direct data requests outside of the NTD reporting	· Various (different for each asset type)	· tbl06AssetInventory · [Unit Replacement Cost]	· FTA Capital Cost Database (2015) · Local Agency asset inventory submissions to FTA (2014 to 2018) · APTA Vehicle Database (2020)
Decay Curve Parameters	· Regression model parameters used to predict current asset condition based on asset type, age, and other asset characteristics (which vary by asset type). TERM uses more than 120 different decay curves, each with at least two, and as many as five, parameter values.	· Various (different for each asset type)	· tbl05AssetTypes · [Various field names for Logit, Spline and LinLog decay models]	· FTA Decay Curves Project (vehicles, structures, stations, and facilities, 2018) · FTA National Condition Assessment (systems assets, 2004 to 2010) · Chicago Transit Authority (CTA) Condition Assessment (track, 1998)
Rehab Parameters	· Parameters that determine the number, cost, and timing of rehabilitations that assets should undergo throughout their useful life (assuming no financial constraints). These parameters are specific to each asset type and TERM allows up to five rehabs per asset type.	· Various (different for each asset type)	· tbl05AssetTypes · [RehabsAllowed], · [RehabXCost], [RehabXAge]	· Industry best practice and the Chicago Regional Transportation Authority Capital Optimization Investment Prioritization Workshops (2015)
Prioritization Criteria Weights	· TERM uses an investment prioritization routine to allocate funding between investment options when total funding is constrained. This parameter determines the weight placed on each of the five investment criteria: asset condition, cost effectiveness, safety, reliability, and O&M cost impact.	· Asset condition 35% · Cost Effectiveness 25% · Safety 20% · Reliability 15% · O&M Cost Impact 5%	tbl23PrioritizationCriteriaWeights · [CondWeight], · [RidershipWeight], · [SafetyWeight], · [ReliabilityWeight], · [CostImpactWeight]	· Chicago Regional Transportation Authority Capital Optimization Investment Prioritization Workshops (2015)
Asset Expansion Growth Rate	· TERM's Expansion with Growth Scenario uses historical (usually 15-year) growth in Unlinked Passenger Trips (UPT) to project ongoing growth in rider demand for transit services. These growth rates are calculated for over 200 different market segments based on three different market stratifications, including mode, urban area size (4 strata) and FTA region (10 strata).	· Vary by market segment	· tbl15aRegionModeGrowth · [SelectedCAGR_Input]	· NTD (2018)
Fleet Size	· Asset expansion growth rate is tied to fleet growth, with the fleet counts obtained from NTD.	· Varies by agency/mode	· tbl03AgencyModeStatistics · [FleetSize]	· NTD (2018)
Route Miles per Peak Vehicle	· Parameter used by the Growth Expansion Module to convert rail fleet expansion investments into the expected number of associated number route miles to support that level of fleet expansion. Calculated as the average number of rail route miles per peak vehicle.	· Varies by rail mode	· tbl12NewStartsModes · [VehiclesPerRouteMile]	· FTA Capital Cost Database (2015)
Cost per Route Mile of Guideway	· This parameter determines the cost of guideway expansion assets by alignment type (e.g., track and structures) as driven by equation 3-4 in the TERM Users Guide.	· Varies by mode	· tbl12NewStartsModes · [AtGradeGwayCost], · [ElevatedGwayCost], · [SubwayGwayCost]	· FTA Capital Cost Database (2015)
Systems Cost per Route Mile of Guideway	· This parameter determines the cost of systems expansions per route mile as driven by equation 3-5 in the TERM Users Guide.	· Varies by mode	· tbl12NewStartsModes · [SystemsCost]	· FTA Capital Cost Database (2015)
Stations per Route Mile	· This parameter determines the number of rail and BRT stations per route mile of guideway for expansion projects (equation 3-6 in the TERM Users Guide).	· Varies by mode	· tbl12NewStartsModes · [StationsPerRouteMile]	· FTA Capital Cost Database (2015)
Cost per Station	· This parameter determines the cost of station expansions as driven by equation 3-6 in the TERM Users Guide.	· Varies by mode	· tbl12NewStartsModes · [AtGradeStationCost], · [ElevatedStationCost], · [SubwayStationCost]	· FTA Capital Cost Database (2015)
ROW Costs Per Mile	· This parameter determines the cost of ROW acquisition for expansion projects.	· Varies by mode	· tbl12NewStartsModes · [ROWCost]	· FTA Capital Cost Database (2015)
Special Conditions Cost per Route Mile	· This parameter determines the cost of special conditions investment costs for expansion projects.	· Varies by mode	· tbl12NewStartsModes · [SpecialCondCost]	· FTA Capital Cost Database (2015)
Soft Costs	· This parameter determines the cost of Soft Costs for expansion projects.	· Varies by mode	· tbl12NewStartsModes · [SoftCosts]	· FTA Capital Cost Database (2015)
Facility Cost per Vehicle	· This parameter determines the cost of expansion facilities on a per vehicle basis as driven by equation 3-7 in the TERM Users Guide.	· Varies by mode	· tbl12NewStartsModes · [FacilitiesCost]	· FTA Capital Cost Database (2015)
Average Passenger Miles per Peak Vehicle	· This parameter is used to determine which agency modes support ridership levels that are too low to warrant investment in expansion vehicles due to natural ridership increases (equation 3-8 in the TERM Users Guide).	· Varies by agency mode	qryFleetExpansionPassPerPeakVehll · [PaxPerPeakVeh]	· NTD (2018)
Average Operating Speed	· This parameter is used to identify urbanized areas have average operating speeds (across all modes) that are low relative to the national average, and hence may warrant investment in higher speed modes (e.g., rail or BRT) to agency modes support ridership levels that are too low to warrant investment in expansion vehicles due to natural ridership increases (equation 4-3 in the TERM Users	· Varies by UZA	qryPerformanceOutput_AvgSpeed · [MeanTrnstSpeed]	· NTD (2018)
Average Operating Speed Maximum Threshold	· Determines how many standard deviations an operator must be below the mean (or more) to justify speed improving expansion investments.	· 1.0	tbl13NationalServiceOccupancyStandards · [ServiceStandardParam]	· User selected variable
Average Peak Vehicle Occupancy	· This parameter is used to determine which agency-modes have rider occupancy levels that are well above the national average, and hence may warrant investment in fleet expansions (equation 4-9 in the TERM Users Guide).	· Varies by agency mode	qryPerformance_Ridership_Perfrom_Occ · [TripsPerVeh]	· NTD (2018)
Average Operating Speed Maximum Threshold	· Determines how many standard deviations an operator must be below the mean to obtain expansion investments to improve speed.	· 1.0	tbl13NationalServiceOccupancyStandards · [OccupancyStandardParamMax]	· User selected variable

Average Agency Mode Speed	· Average speed for a given agency-mode.	· Varies by agency mode	· tbl03AgencyModeStatistics · [ModeSpeed]	· NTD (2018)
Average Agency Mode Headway	· Average headway for a given agency-mode.	· Varies by agency mode	· tbl03AgencyModeStatistics · [AvgHeadway]	· NTD (2018)
Average Agency Mode Fare	· Average fare for a given agency-mode.	· Varies by agency mode	· tbl03AgencyModeStatistics · [AvgFare]	· NTD (2018)
Agency Mode O&M Costs	· Total O&M costs by agency-mode.	· Varies by agency mode	· tbl03AgencyModeStatistics · [O&MCosts]	· NTD (2018)
Agency Mode O&M Costs: Vehicle Operations	· Total O&M costs for Vehicle Operations by agency-mode; these costs are considered variable.	· Varies by agency mode	· tbl03AgencyModeStatistics · [O&MCosts_VehOps]	· NTD (2018)
Agency Mode O&M Costs: Vehicle Maintenance	· Total O&M costs for Vehicle Maintenance by agency-mode; these costs are considered variable.	· Varies by agency mode	· tbl03AgencyModeStatistics · [O&MCosts_VehMaint]	· NTD (2018)
Average Mode Speed	· Average speed for a given agency-mode.	· Varies by agency mode	· tbl14ModeTypes · [ModeSpeed]	· NTD (2018)
Average Mode Headway	· Average headway for a given agency-mode.	· Varies by agency mode	· tbl14ModeTypes · [AvgHeadway]	· NTD (2018)
Average Mode Fare	· Average fare for a given agency-mode.	· Varies by agency mode	· tbl14ModeTypes · [AvgFare]	· NTD (2018)
Average Mode Trip Length	· Average fare for a given agency-mode.	· Varies by agency mode	· tbl14ModeTypes · [TripLength]	· NTD (2018)
Average Mode Elasticity	· Average fare for a given agency-mode.	· Varies by agency mode	· tbl14ModeTypes · [Elasticity]	· NTD (2018)
Maximum Rail Miles Built Constraint	· This parameter limits the number of miles of rail investment that can be made an expansion module in a single year. It is intended to recognize the physical and project management limits to the rate of rail expansion in any given year.	· 5 miles per year	sub13ImprovePerformSpeed, sub14ImprovePerformanceVehOcc	· Analysis of the average annual rate of expansion for major rail build outs in specific UZA's as documented in FTA's Capital Cost Database (circa 2004)
Minimum Riders per Vehicle	· This is a threshold parameter used by the Improve Average Speed Expansion Module to ensure that vehicle occupancy has attained a required minimum level before TERM will permit expansion investments.	· National average occupancy less one standard deviation	qryPerformanceOutput_AvgSpeed · [MeanTrnstSpeed]- [StdDevTrnstSpeed]	· NTD (2018)
Discount Rate	· Discount rate used for net present value calculations in TERM's benefit cost analysis.	· 0.7%	· tbl17FinancialAssumptions	· Standard Assumption for Federal Government B/C analysis
Value of Time	· The value of time is the opportunity cost of the time a traveler spends on their journey. This value is used throughout the C&P Report to assess the benefits generated by transit investments.	· \$15.20 per hour	· tbl08CostBenefitMeasures · [ValueOfTime]	· Benefit-Cost Analysis Guidance for Discretionary Grant Programs, Office of Secretary of Transportation, US DOT (2020)
In-Vehicle Time	· Average end-to-end trip time for riders once on a transit vehicle.	· Varies by agency/mode	· tblRehabReplaceCostBenefit · [TripTime]	· NTD (2018)
Wait Time	· Average time spent waiting for a transit vehicle to arrive, calculated as ½ of the headway.	· Varies by agency/mode	· tblRehabReplaceCostBenefit · [OutOfVehicleTime]	· NTD (2018)
Transit Fare	· Average out-of-pocket cost to make an unlinked transit trip.	· Varies by agency/mode	· tblRehabReplaceCostBenefit · [Fare]	· NTD (2018)
Auto Trip Cost Per Mile	· Auto user trip cost, used to assess relative trip costs for auto vs transit modes.	· \$0.58993	· tbl08CostBenefitMeasures · [AutoUsersCost]	· BTS (2018)
Auto Occupancy Rates	· Number or riders per vehicle for auto trips.	· Varies by UZA	· tbl15UZADemographics · [Auto Occupancy]	· National Household Travel Surveys
Parking Cost	· Average daily cost of parking (cost of auto use as alternative to transit).	· Varies by UZA size	· tbl08CostBenefitMeasures · [AvgParkingCost]	· Colliers Parking Rate Survey (2018)
Taxi Cost	· Taxi cost per mile (modal alternative to transit). Includes both first mile and additional mile charges.	· Varies by UZA size	· tbl08CostBenefitMeasures · [CabRate_Initial], [CabRate_FirstMile], [CabRate_AdditionalMiles]	· Numbeo Taxi Rate Survey (2020)
Dependent Rider Share	· Percent of transit riders that do not have auto access, by mode.	· Varies by Mode	· tbl03AgencyModeStatistics · [CaptiveRiders]	· National Household Transportation Survey (2009)
New Mode Ridership	· Set equal to (unlinked trips per route mile)*(new route miles). Only for investment in avg. speed improvements.	· Varies by Mode	· tbl12NewStartsModes · [Trips]	· NTD (2018)
Trip Cost Elasticity by Mode	· Determines sensitivity of ridership to change in the total cost of travel by each mode.	· Varies by Mode	· tbl14ModeTypes · [Elasticity]	· Literature review
Mode Alternative Shares	· Mode options for travelers currently using a specific transit mode (expressed as percent probabilities of selecting each of the available alternatives). For example, rail riders typically have a range of potential options including drive, bus, taxi, walk, bicycle or forego the trip. · The probability of selecting a specific mode as the preferred alternative mode is defined in percent values that sum to 100%.	· Varies by Mode	· tblModeAlternatives · [Captivity_Bus], [Captivity_Auto], [Captivity_Auto Captivity_Walk], [Captivity_Bike], [Captivity_Taxi], [Captivity_Shared], [Captivity_NoTrin]	· National Household Transportation Survey (2009)
Congestion Delay Cost (Per VMT)	· Average cost of delay from adding an additional VMT to roadway network due to increased travel time (cost of auto use as alternative to transit).	· \$0.1873	· tbl08CostBenefitMeasures · [CongestionDelayCost]	· Final Report on the Federal Highway Cost Allocation Study, FHWA (2000)
Pollution Emissions Cost per VMT	· Average cost of air pollution from adding an additional VMT to roadway network due to increased vehicle emissions (cost of auto use as alternative to transit).	· \$0.0147	· tbl08CostBenefitMeasures · [EmissionsCost_Air]	· Final Report on the Federal Highway Cost Allocation Study, FHWA (2000)
Noise Emissions Cost per VMT	· Average cost of noise pollution from adding an additional VMT to roadway network (cost of auto use as alternative to transit).	· \$0.0010	· tbl08CostBenefitMeasures · [EmissionsCost_Noise]	· Final Report on the Federal Highway Cost Allocation Study, FHWA (2000)
Accident Cost per VMT	· Average cost of auto accidents from adding an additional VMT to roadway network (cost of auto use as alternative to transit).	· \$0.0131	· tbl08CostBenefitMeasures · [CrashCost]	· Final Report on the Federal Highway Cost Allocation Study, FHWA (2000)
Roadway Wear Cost per VMT	· Average cost of roadway wear from adding an additional VMT to roadway network (cost of auto use as alternative to transit).	· \$0.0011	· tbl08CostBenefitMeasures · [RoadwareCost]	· Final Report on the Federal Highway Cost Allocation Study, FHWA (2000)
Bus Congestion Delay Cost (Per VMT)	· Average cost of delay from adding an additional VMT to roadway network due to increased travel time (cost of auto use as alternative to transit).	· \$0.1873	· tbl08CostBenefitMeasures · [BusCongestionDelayCost]	· Final Report on the Federal Highway Cost Allocation Study, FHWA (2000)

Bus Pollution Emissions Cost per VMT	· Average cost of air pollution from adding an additional VMT to roadway network due to increased vehicle emissions (cost of auto use as alternative to transit).	· \$0.0147	· tbl08CostBenefitMeasures · [BusEmmissionsCost_Air]	· Final Report on the Federal Highway Cost Allocation Study, FHWA (2000)
Bus Noise Emissions Cost per VMT	· Average cost of noise pollution from adding an additional VMT to roadway network (cost of auto use as alternative to transit).	· \$0.0010	· tbl08CostBenefitMeasures · [BusEmmissionsCost_Noise]	· Final Report on the Federal Highway Cost Allocation Study, FHWA (2000)
Bus Accident Cost Per VMT	· Average cost of auto accidents from adding an additional VMT to roadway network (cost of auto use as alternative to transit).	· \$0.0131	· tbl08CostBenefitMeasures · [BusCrashCost]	· Final Report on the Federal Highway Cost Allocation Study, FHWA (2000)
Bus Roadway Wear Cost Per VMT	· Average cost of roadway wear from adding an additional VMT to roadway network (cost of auto use as alternative to transit).	· \$0.0011	· tbl08CostBenefitMeasures · [BusRoadwareCost]	· Final Report on the Federal Highway Cost Allocation Study, FHWA (2000)
Transit Mode O&M Costs Per Route Mile	· Both fixed and variable O&M costs per mile used as input for benefit-cost analysis. · Fleet operating and maintenance costs are considered variable, with increasing route miles resulting from performance improvement related expansion investments generating increasing operating and maintenance costs (but no change in administrative costs). · In contrast, investments to maintain assets or grow service in alignment with general ridership increases, all O&M costs, including admin, are included in the benefit cost calculations, with operating and maintenance costs being variable where expansion is present,	· Varies by agency mode	· tbl12NewStartsModes · [OMPerRtMile]	· NTD (2018)
Revenue Vehicle Mile per Vehicle	· Parameter used to determine the number of additional vehicles required to support a given level of revenue vehicle miles as determined by the Service Coverage and Service Frequency expansion components.	· Varies by mode	tblExpansion_RVM_VehicleDrivers [RVMPerVehicle]	· NTD (2018)
Spare Ratio	· The ratio of number of spare vehicles to the number of vehicles required to support a given service level. Used to determine the total fleet expansion requirements for the Service Coverage and Service Frequency expansion components.	· 0.2	tblExpansion_RVM_VehicleDrivers · [SpareRatio]	· Industry standard
Equipment and Facility Cost Factors	· Factors used to expand the purchase cost of an individual vehicle to cover the cost of the facilities and maintenance equipment required to house and maintain expansion vehicles generated by the Service Coverage and Service Frequency expansion components.	· Varies by agency mode	tblExpansion_RVM_VehicleDrivers · [AcquisitionCostFactor]	· NTD (2018)
Operating Costs Per Route Mile for New Starts Projects	· Hard-coded parameter to estimate variable operating costs per route mile for New Starts projects (i.e., to exclude fixed O&M costs).	· 0.33592	mod7NewStartsBenCostAnalysis · [OperatingCosts]	· NTD (2015)
Ceiling on Out of Vehicle Wait time (New Starts)	· Ceiling on out-of-vehicle wait time set to 10 minutes for new starts investments; assumes most riders of services with longer headways will time their arrival time based on their understanding of the schedule.	· 0.166667 hours (ten minutes)	mod7NewStartsBenCostAnalysis · [Out_of_Vehicle_Time]	· Assumed value
Average Transit Asset Lifespan	· Value used to calculate annualized cost of expansion assets for benefit-cost analysis for new starts investments.	· 66.09 years	mod7NewStartsBenCostAnalysis · [LifeSpan]	· Standard value used for FTA New Starts Investments
Reduction in O&M Costs from Rehab-Replacement Investments	· Value that provides an expected percent reduction in O&M costs resulting from the replacement of older transit assets, with newer, more reliable assets (with lower maintenance costs).	· 0.2069 rail · 0.1435 bus	sub08CostBenefitAnalysisRehabReplace · [OpAndMaintCostReduction]	· 2014 RTA analysis of impact of reinvestment on transit asset O&M costs
Benefit Cost Ratio Partial Pass Adjustment Factor	· An exponential factor to reduce the level (and cost) of expansion investments for agency-modes that fail the benefit cost test, such that a portion of these expansion investments do pass the test.	· 0.3297	sub08CostBenefitAnalysisRehabReplace · [BenCostRatio_PartialFactor]	· 2010 Analysis of benefit-cost test results for agency-modes with expansion investments
Out of Vehicle Wait Time (Rehab Replacement)	· Ceiling on-out-of-vehicle wait time set to 1/3rd of the headway – assumes most riders of services with longer headways will time their arrival time based on their understanding of the schedule.	· 0.33% of headway	sub08CostBenefitAnalysisRehabReplace · [OutOfVehicleTime]	· Assumed value
Revenue Vehicle Miles to Total Vehicle Miles	· Factor to adjust revenue vehicle miles to total vehicle miles (i.e., including dead heading) for use in TERM's benefit-cost calculations.	· 0.87	sub08CostBenefitAnalysisRehabReplace · [OperatingCosts]	· NTD (2014)
Benefit Cost Ratio for DR	· Demand response investments that fail TERM's benefit cost test are given a passing value.	· 1.01	sub08CostBenefitAnalysisRehabReplace · [BenCostRatio]	· Assumed value