# Index

accountability
decision-making on mega-projects 9–10, 178, 202, 203
large engineering projects 160, 168
mega-projects 182, 219
of project managers 182
public–private partnership (PPP) 205–6
transport infrastructure projects 138–9
Affuso, L. 9, 110
airports, rail links to see rail links to airports
Akintoye, A. and M. Beck 192, 197
Altshuler, A. and D. Luberoff 4–5, 11, 24, 105, 176, 240
appraisal methods
decision-making on mega-projects 76–80, 108–10, 114–15, 224, 320–21
transport infrastructure projects 76–80, 108–10, 114–15
Argentine, build, operate and transfer (BOT) contracts 194–5
Aschauer, D.A. 68, 75
Australia
build, operate and transfer (BOT) contracts 199, 202–3
institutional transport investment structures 320
Melbourne City Link project 199, 202–3
public–private partnership (PPP) 190, 197, 199, 200, 202–3, 318, 319
Sydney Airlink project 202
Sydney M2 Motorway 202
Austria
motorway and expressway network 223
New Austrian Tunnelling Method 26
TEN (Trans-European Network) high-priority projects 231
Banister, D. and J. Berechman 107, 116
Bates, J. 52
Bel, G. and X. Fageda 223
Belgium
Brussels Airport 287, 292
TEN (Trans-European Network) high-priority projects 231
Bell, R. 84, 105
Bemelmans-Videc, M. 181
Bennet, E. and P. Grohmann 192, 193, 195
Biehl, D. 68
Black, W. 300
Bloomfield, P. 200
Boardman, A. 198, 200
Bonnafoous, A. and Y. Crozet 9, 110
Borger, B. and S. Proost 285
Brazil
ITA power plant 157
Tucurui dam 169
Bröcker, J. 74, 75
Brockner, J. and J. Rubin 12, 116
Brooks, J. and P. Trevelyan 121
Brown, R. 299
Bruseppe, N. 4, 7–8, 40, 47, 48, 50, 52, 84, 87, 105, 116, 121, 137, 138, 147, 176, 182, 189, 192, 195, 197, 207, 217, 218, 233, 318
build–operate–transfer (BOT) schemes, large engineering projects 157, 159, 194–5, 197, 198, 199, 202–3
Bulgaria, design, build, finance, operate (DBFO) contract 198
Button, K. 41
Cabanatuan, M. 254, 255
Canada
cost overruns 131, 132
infrastructure projects, Nova Scotia 197
Montreal–Ottawa high-speed rail corridor 222
Index

public–private partnership (PPP) 197, 198–9, 200
rail links to airports, number of 281
water projects 202
Castles, F. 309
Cerasoli, R. 37
Cervero, R. 304, 315
Chang, M. 193
China
build, operate and transfer (BOT) contracts 197, 198
maglev train connection, Shanghai 89
sewage treatment plants 193–4
Chisholm, D. 36
Ciccone, A. 71
city revitalisation projects 196, 197
Cleland, D. 24, 154
competition
economic impact on 70, 77, 78, 139–40, 220
imperfect 69–70, 71–2, 74, 77, 78
lack of, public–private partnership (PPP) 204–5, 219, 319
rail links to airports 284–5, 288, 289–90, 293–4, 295–9
and railway systems, dedicated 263–80
contested information see mega-projects and contested information
contracts
concession, public–private partnership (PPP) 194, 195, 198, 200, 207, 219, 223
concession, railway systems, dedicated 271–2, 275
dependency, ex post 206–7
five-year plan 321–3
‘hold-up’ phenomenon 207
public–private partnership (PPP) 192–5, 200, 204, 205–7, 223, 318
railway systems, dedicated 264–70, 273, 278
renegotiation 207
cost overruns
decision-making on mega-projects 11–12, 131, 132, 216
large engineering projects 163
cost–benefit analyses
management characteristics of mega-projects, problems with 23, 24
mega-projects 40, 216, 221–2, 224, 226, 227–8
OEI directives 91
private risk capital 220
public planning calculations 217
public–private partnership (PPP) 195, 207, 216–17, 220
transport infrastructure projects see transport infrastructure projects, cost–benefit analysis
de Bruijn, Hans 23–39, 84–101, 205
de Jong, W. Martin 304–26
De Ridder, H. 265
Debrezion, G. 292
decision-making on mega-projects accountability 9–10, 178, 202, 203
Bay Area model 36
budget overruns 11–12, 131, 132, 216
common pitfalls 4–12
contested information see mega-projects and contested information
cost estimation 7–8, 178, 184, 185, 186, 187
and cost–benefit analysis see cost–benefit analysis
front-end phase 177–8, 179, 180–81, 183–7
government support 5, 12, 31, 35–6, 114–15, 178
IMEC study see large engineering projects
implementation phase 178, 179
international planning 11
large engineering projects see large engineering projects
management characteristics 24, 34–6
misinformation 7–8, 184
pork-barrel policies 189
problem analysis, valid 107–8, 116, 178–81
problem, focussing on 106–7
Index

project alternatives, consideration of 187
project management 178, 179, 183–7
public–private partnership (PPP) 192, 202–3, 319
quality checks 9, 10, 184, 186
research into 11
risk management 6–7, 11, 115
SDM (system dynamic models) software 228
sponsorship 6
staged approach 105–19, 224, 227
systems analysis 110–15
tactical and strategic, differences between 177–8, 179–81
and technological sublime see technological sublime
transport infrastructure projects see transport infrastructure projects
Denmark
Great Belt Bridge and Tunnel 216
Great Belt toll bridge 195
institutional transport investment structures 312, 315
Ørestad Metro Line 273–4
Oeresund tunnel 195, 216
public–private partnerships (PPP) 196
road vehicles, inaccuracy in forecasting 129
TEN (Trans-European Network) high-priority projects 231
design, build, finance, operate (DBFO) contracts, public–private partnership (PPP) 194, 197, 198, 199, 204, 219, 220, 318
design, build, operate and maintain (DBOM), railway systems, dedicated 265–6, 268, 270, 271, 277–8
Dodgson, J. 67
Dolowitz, D. 304
Donahue, J. 263
Dorland, C. and H. Jansen 53
Douglas, M. and A. Wildavsky 85
Duivesteijn Commission (TCI) 11–12
Dupuit, J. 67

Eddington, R. 301
Eijgenraam, C. 12, 116
Elhorst, J. 51, 76, 79, 116
Etzioni, A. 94
Europe
air transport deregulation 295
ASTRA-T modules and interfaces 229–31, 234
BEACON project 55
CGEurope model 46, 75
cost overruns 131, 132
cross-border projects 55
emissions regulations 53–4
European Framework Programme 227
HEATCO project 55
HST network 295
IASON project 227
institutional framework 304, 305
institutional transport investment structures 311–15, 321–2
mega-projects bias 10
rail links to airports, number of 281
rail transport decision-making transparency 9–10
rail transport investment 8–9, 268, 270–75
RAILPAG study 223–4
road vehicles, inaccuracy in forecasting 129
SMCP-tolls projects 232
TEN (Trans-European Network) high-priority projects 75, 79, 231–3
TIPMAC project 227, 230, 231, 232
TIPP project 296–7
vertical integration of rail systems 263
see also individual countries
Eyre, N. 53
financial risk
large engineering projects 149–51, 159–61, 163, 164, 167–71, 184–6
Private Finance Initiative (PFI) 190, 194, 196, 197, 199, 201, 205, 209
Findeisen, W. and E. Quade 112, 115, 116

Finland
design, build, finance, operate (DBFO) contracts 197
institutional transport investment structures 320
Lathi Motorway 197
Private Finance Initiative (PFI) 197
public–private partnership (PPP) 318, 319–20
TEN (Trans-European Network) high-priority projects 231

Fitzgerald, P. 200

Flyvbjerg, Bent 1–20, 48, 85, 92, 114, 120–44, 258, 259, 315
with N. Bruzelius and W. Rothengatter 4, 7–8, 40, 47, 50, 84, 87, 105, 116, 147, 176, 182, 197, 207, 217, 218, 233, 318

Fouracre, P. 121

France
CDG Airport, profile of 286, 287, 293–6
CDG Airport rail link 282, 283, 284, 289, 292, 293, 297, 299
Channel Tunnel 32, 79, 207, 216, 223
HST rail network 9, 88, 293–4, 295–6, 299
institutional transport investment structures 312, 315, 320, 322
light rail systems 10
Paris–Lyon TGV 88
public–private partnership (PPP) 197
RER connection to CDG 282, 293
Rouen metro concession 271
TEN (Trans-European Network) high-priority projects 231
TGV Air services 294, 295–6
toll roads 196–7
water and sewage 198

Frick, Karen Trapenberg 239–62

Fujita, M. and J. Thisse 69, 71

Fullerton, B. and S. Openshaw 121

Germany
Bavaria maglev project 221
design, build, finance, operate (DBFO) contracts 197

Dortmund subway tunnel 37
Frankfurt Airport 226
Frankfurt Airport rail link 283, 284, 289, 292, 293, 299
Hamburg–Berlin maglev project 221
Herrentunnel, Lübeck 30
institutional framework 304, 309
institutional transport investment structures 312, 314, 315, 320, 322
Munich II airport terminal 220
Munich Transrapid Airport Shuttle 221, 222
Nordhein–Westfalen Metrorapid maglev project 221, 222
road and rail projects 9, 197, 215
TEN (Trans-European Network) high-priority projects 231
transport infrastructure investment evaluation scheme 221, 309
Warnow tunnel 87

Gille, J. 57, 62
Givoni, Moshe 281–303
governability
large engineering projects 146–7, 151, 152, 158–9, 162–71
political problems, untamed, mega-projects and contested information 86, 90
government
performance standards, public–private partnership (PPP) 192–3
regulation, front-end governance of mega-projects 181–2
support, decision-making on mega-projects 5, 12, 31, 35–6, 114–15, 140, 178
see also institutional effects
Graham, D. 71, 77, 78
Gramlich, E. 68–9
Gray, J. 197
Greece, TEN (Trans-European Network) high-priority projects 231

Gunn, H. 41, 52, 74, 77

Haarmeyer, D. and D. Coy 198
Hall, J. 199, 200
Hall, P. 1, 24, 84, 121
Index

Hann, N. and T. Mack 265, 266
Hay, A. 79
Hayashi, Y. and H. Morisugi 40
Heinitz, F. 225
Hodge, G. 190, 199, 202
Hong Kong
  build, operate and invest (BOT) contracts 197
  Cross Harbour Tunnel (CHT) 197
Hoppe, R. 93
Hughes, T. 147
Hungary, M1 project 219
hydroelectric power systems 149, 175, 180

ICT projects, Weigh in Motion 29
IMEC study see large engineering projects

innovation
  planning mega-projects 215–38
  and public–private partnership (PPP) 192, 201, 202, 205, 318
technology and management
  characteristics of mega-projects 26–7, 30, 34, 37

innovation, institutional 218–20
constraint logic programming (CLP) 225–6
consultant risk-taking 221–2
dynamic assessment of mega-projects 227–33
mediation process 225–6
risk allocation strategies 222–3
shareholder integration 220–21
stakeholder preferences 223–6

institutional effects
  benevolent dictators 313
  cooperative interactors 313
corporatism–pluralism 312–13, 314, 315, 319, 324
cross-national lessons 304–26
democracy–technocracy 311, 312–13, 314, 315, 316–17, 324
federalism–unitarism 311, 312–13, 314, 315, 324
five-year plan contracts 321–3
hierarchical determinators 313, 314
individualist competitors 313, 314, 319

institutionalised appraisal methods 320–21
integralism–reductionism 312–13, 314, 315, 319, 324
investment structures 311–15
public–private partnership (PPP) 195
rail links to airports 296–9
structures, types of 313–15
transplants 309–11, 315–23
transport investment structures 307–9, 311–15, 320, 321–2

see also government
institutional risks, large engineering projects 149, 150, 151, 152, 159–60, 161, 164, 168
Ireland, TEN (Trans-European Network) high-priority projects 231

Italy
  high-speed rail links 232
TEN (Trans-European Network) high-priority projects 231

Jacoby, W. 305
Japan
  build, operate and invest (BOT) contracts 197
  high-speed rail projects 9, 88
  highway developments, regional impact 76
  Narita Airport, Tokyo rail link 282, 284
  Three Power Source Laws System 160

Jara-Diaz, S. 67, 69
Jasanoff, S. 92
Johnson, R. and A. Moore 198
Johnston, J. and B. Romzek 202
Johnstone, N. and L. Wood 189, 190, 191, 195, 207

Joosten, W. 189, 204

Kahneman, D 133, 134–5, 136, 258
Kain, J. 121
Klijn, E.-H. 195, 196, 199, 201
Koning, M. 53
Koopmans, C. and E. Kroes 59
Koppenjan, Joop 189–212
Korea, build, operate and invest (BOT) contracts 197, 198
Krugman, P. 69
Kumaraswamy, M. and X. Zhang 197
Laird, J. 79
Lakshmanan, T. and W. Anderson 235
Lam, T. and K. Small 52
large engineering projects accountability 160, 168
action strategies 157
allocation strategies 156, 158, 167
build-operate-transfer (BOT) schemes 157, 159, 194–5, 197, 198, 199, 202–3
closure process 165, 168–9
closure strategy 156, 158, 159
cohesion and governability 158
completion risks 149, 150, 151
construction risks 149, 150
contingency allowances 158
contract length 158–9, 161, 170
cost overruns 163
cost-reimbursement contracts 157
countering forces, dealing with 164–5
decisioneering approaches 154, 162–3, 164, 169
development costs 154
economic-dispatch formulas 157
evolutionary nature of 162–71
execution risks 150
financial risks 149–51, 159–61, 163, 164, 167–71, 184–6
flexibility 158–9, 160
governability 146–7, 151, 152, 158–9, 162–71
IMEC study outline 5–7, 147–8, 176, 181
information/selection strategies 155
initiation and exploration 167
institutional risks 149, 150, 151, 152, 159–60, 161, 164, 168
knowledge accumulation 170–71
legitimacy enhancement 160, 164
long-term investment stabilisation 159–60
market-related risks 149, 150, 151, 159
momentum building 164
opportunity failures and oversights 152, 163
performance measurement 163
portfolio diversification 161
power-purchase agreements 160
price-determination formulas 156–7
probabilistic approaches 154
proposal development 167–8
real-options framework 145, 146, 164–5
regulatory risks 149, 150, 151, 157, 165, 167
residual risks 161–2
response failures and oversights 152, 163
risk management, approaches to 152–62, 169
risks, nature of 148–52
sensitivity analysis 154
shaping episodes 163–4, 165–7, 168, 169
social-acceptability risks 151, 152, 160, 168
sovereign risks 149, 150, 151
sponsorship 146, 150, 151, 153, 154, 158–61, 163–5, 167, 168, 170–71
staffing considerations 169–70
stakeholder involvement 156, 157, 160, 161, 164, 167
strategy, robust 154–7
supply risks 149, 150
technical risks 149, 150
technical systems, robust 154–7
turbulence 151–2, 158, 160, 161, 163
Leijten, Martijn 23–39, 84–101, 204, 205
Leleur, S. 315
Lerner, A. 36
Lessard, Donald R. 4, 5–7, 33, 145–72, 176, 181
Letza, S. 263
Li, B. and A. Akintoye 191
Liedtke, G. 225
Lijphart, A. 309
Lindblom, C. and D. Cohen 93
List, F. 215
Lovaio, D. and D. Kahnemann 133, 134–5, 136
Low, B. 36
Index

Luxembourg, TEN (Trans-European Network) high-priority projects 231
Lynde, C. and J. Richmond 68
McCormick, E. 247, 257
Mackie, P. and J. Preston 10, 112
Mackinder, I. and S. Evans 121
maglev technology 50, 58, 76, 89, 202, 221, 222
Malaysia, build, operate and invest (BOT) contracts 197
management characteristics of mega-projects
accountability 182
blocking power, external 32, 35–6
command-and-control approach 34
cost-effectiveness problems 23, 24
decision-making process 24, 34–6
fallback options 29
functionality of project 29
future orientation, lack of 23
implementation management 33–7
incremental implementation 29–30
interaction 33–4
and organisational redundancy 36–7
process design 33–4
process versus project approach 34–6
project design robustness 25–6, 35
project divisibility 27, 30
project opposition, external 33–4
project transformation time 32
radical implementation 29–30
social complexity 23, 24, 30–34
task separation 36–7
technical complexity 23, 24–30, 32, 33–4, 36–7
and technology, innovative 26–7, 30, 34, 37
and technology, proven 26–7
tight or loose coupling 28–9
uncertainty management 32–4, 35–7
user dependence 30–31
user preferences 31–2
Mantzavinos, C. 307
March, J. and J. Olsen 306
Martin, L. 199
Marx, L. 239, 242
Meadows, D. 229
mega-projects
accountability 182, 219
characteristics 240–41
contractual arrangements 178, 179, 217, 221, 222
cost overruns 175, 187, 216, 217
cost–benefit analysis 40, 216, 221–2, 224, 226, 227–8
decision-making see decision-making
design criteria for governance regime 182
economic impact analysis 227, 234–5
effectiveness 175–6, 179, 180, 181
efficiency in 173–4, 175, 179
ex-ante evaluation 40–65
expert involvement 94–5, 96, 97–8, 139, 184–5
failure of 176, 177, 180, 181
feasibility study 222, 224, 226
front-end governance (regulation) 181–2
impact 175, 179, 180
innovation, institutional see
innovation, institutional
innovation in planning 215–38
large engineering projects see large engineering projects
life cycle 176–8, 182
management characteristics see
management characteristics of mega-projects
operational phase 178
paradox 182
procurement scheme 217–18, 221
public planning of 120–44
and public–private partnerships (PPP) see public–private partnerships (PPP)
relevance 175, 178, 179–80
risk management 145–72, 182
stakeholders 176–8, 180, 181, 183, 186, 218
sustainability 175, 179, 180
system dynamic modelling (SDM) and truth-telling 233–5
tactical and strategic performance 174–6, 177, 179, 180
TEN (Trans-European Network) high priority projects 75, 79, 231–3
mega-projects and contested information
consensus building 95–6, 98, 114
contested information, accumulation of 91–2
data and future analysis 87, 90
decision-making 90–92, 95–8
definition of 85–6
ethical problems 85–6
expert involvement 94–5, 96, 97–8, 139
facts 86–9, 92, 96
methods for dealing with 87, 92–8
misinformation see misinformation
negotiated knowledge 91–2, 93–6, 97–8
normative standards 89–90
optimisations 88–9, 90
political problems, untamed 86, 90
process incentives 97–8
process management 96–7
project company procurement scheme 204, 218–19
rationality, procedural and interactive 93, 94–5
scientific problems 86, 87
stakeholder involvement 91–2, 96, 98, 139, 241, 255
strategic misrepresentation 92, 93, 136–8
system boundaries 88, 90
tamed problems 85
trade-offs 89–90
uncertainty 86
unfreezing information 94–5
Megginson, W. and J. Netter 263
Mexico
motorway construction 197
public–private partnership (PPP) 197
Miller, Roger 4, 5–7, 33, 145–72, 147, 148–9, 176, 181, 182
Miser, H. and E. Quade 111–12, 113, 116
misinformation
contested information see mega-projects and contested information
and decision-making on mega-projects 7–8, 184
strategic misrepresentation 92, 93, 136–8
system dynamic modelling (SDM) and truth-telling 233–5
Miyagi, T. 76
Morris, P. and G. Hough 34, 105
Mulder, M. 277
Nash, C 297, 304
Nelson, R. and S. Winter 307
Netherlands
Betuwe Freight Railway Link 11, 12, 49, 108–9, 114, 202
C2000 emergency services project 30–31
design, build, finance, operate (DBFO) contract 198, 204
do-no-harm approach 11
Duivesteijn Commission (TCI) 11–12
Eastern Scheldt Storm Surge Barrier 32
government control of transport 297–8
Green Heart Tunnel 11, 33
High Speed Rail Link 11, 12, 76, 109, 114, 200, 201, 202, 204, 205, 271, 275–6, 292, 299
institutional transport investment structures 312, 315
institutional framework 309
motorway conversion (A59) 199–200, 204
Private Finance Initiative (PFI) 197
project finance 11–12
public–private partnership (PPP) 190, 196, 199–200, 201, 202, 204, 205, 206–7
RAEM model 46
road project (N31) 200, 204
road tunnels 200
sale-and-leaseback constructions 198
Schiphol Airport, Amsterdam, profile of 286, 287, 290–93
Schiphol Airport, Amsterdam rail link 284, 296, 298, 299
Souterrain tram tunnel project, The Hague 28
Superbus track 110
TEN (Trans-European Network)
high-priority projects 231, 232
transport infrastructure appraisal
108, 232, 309
Tweede Heinenoordtunnel 26
urban development projects 206–7
wastewater treatment, Delfland 198
water and sewage 198
WESTERSCHELDT Tunnel 195
Zuiderzee Link (high-speed between
Amsterdam and Groningen)
109, 114, 202
New Zealand, public–private
partnership (PPP) 318, 319
Newman, P. and A. Thornley 309
Newton, P. 53
Nijkamp, P. and B. Ubbels 121
Nilsson, J. 110
Niskanen, E. 297
Noordsij, R. and H. de Bruijn 90
North, D. 307
Norway
ASTRA-T modules and interfaces
229–31
hydroelectric power projects 175, 180
international development projects'
study 180
mega-projects, front-end governance
improvements 183–7
onshore torpedo battery 176, 179
Oslo national university hospital
175, 179
public–private partnership (PPP)
318, 319–20
Royal Ministry of Finance system
170
Trondheim Airport air traffic control
centre 175–6, 179–80
nuclear power projects, risk
management 149
Nye, D. 239, 242
Odeck, J. 40
oil platforms, risk management 149,
150
Oosterhaven, J. 46, 60, 76, 79, 116
Osborne, S. 190
Pakkala, P. 304, 318
Perl, A. 295, 296, 297, 300–301
Philippines
build, operate and invest (BOT)
contracts 197, 198
Manila water supply 195
Pickrell, D. 7, 105, 120, 121
Pigou, A. 67
political risk, public–private
partnership (PPP) 207–8, 222, 223
political tool, as technological sublime
243
Pollit, M. 189, 190, 191, 194, 196, 199,
200, 201, 204, 205, 207
Portugal
build, operate and invest (BOT)
contracts 197
Private Finance Initiative (PFI) 197
TEN (Trans-European Network)
high-priority projects 231, 232
Priemus, Hugo 1–20, 105–19, 120
Private Finance Initiative (PFI) 190,
194, 196, 197, 199, 201, 205, 209
public–private partnership (PPP)
accountability 205–6
alliance model 195, 196
asset liability management 222–3
Australia 190, 197, 199, 200, 202–3,
318, 319
benefit-sharing arrangements 194
bonus provisions 194
build, operate and invest (BOT)
194–5, 197, 202
cartels 319
cherry-picking of components 206–7
choice justification 200
competition, lack of 204–5, 219,
319
concession contracts 194, 195, 198,
200, 207, 219, 223
contract dependence, ex post 206–7
contract ‘hold-up’ phenomenon
207
contract renegotiation 207
contractual arrangements 192–5,
200, 201, 204, 205–7, 223, 318
cost effectiveness 195, 207, 216–17,
220
decision-making, improved 192,
202–3, 319
definition 191
demand risk 222, 223
design, build, finance, operate (DBFO) contracts 194, 197, 198, 199, 204, 219, 220, 318
discount rates 200
efficiency returns 200
EGAP (everything goes according to plan) principle 217
expectations, living up to 196–203
formation and operation of 203–8
government performance standards 192–3
government-pay system 194
innovation 192, 201, 202, 205, 318
institutional 195
introduction of, difficulties with 198–9
joint ventures 195, 201, 255
knowledge management 204
late involvement of private parties 205
motives 191–2
operation, maintenance and service contracts 192–4
penalty provisions 194
political risk 207–8, 222, 223
Private Finance Initiative (PFI) 190, 194, 196, 197, 199, 201, 205, 209
private investment 191–2
private investment, realisation of 196–9
private risk capital 220
problems with 190
procurement processes 204
project company under private law 218–19
project management 192, 201, 202–3
quality assessment 192, 202–3, 206, 318
railway systems, dedicated 266, 273, 275
risk assessment 192, 202, 222–3, 318–19
scoping of 219
special-purpose vehicle (SPV) 195
stakeholder involvement 205–6
state-owned enterprises 195
system dynamic modelling (SDM) and truth-telling 233–5
toll charging 194, 195, 196–7, 318
transaction costs 204
transfer–operate–transfer (TOT) arrangements 193
transport infrastructure projects 79–80, 139–40, 190, 197, 318–20
user-pay system 194, 198, 318
value for money 192, 199–201, 203, 205, 234
quality assessment
decision-making on mega-projects 9, 10, 184, 186
public–private partnership (PPP) 192, 202–3, 206, 318
Quinet, E. 110
R&D projects, risk management 149
rail links to airports
air traffic demand 284–5, 288, 289–90, 292
airport cities 293, 298
catchment area 283–4
city connection 282, 283, 287, 288, 293
city metro connection 282, 283, 287, 288, 289
major hub airports 283–4, 290–93, 299
number of 281
terminal interchange 284, 289, 296
rail projects
cost estimation 7
cross-border harmonisation 54–5
energy use of trains 54
high-speed tracks 29
investment levels 8–9
land-use efficiency 51
light rail systems 10–11
Index

maglev technology 50, 58, 76, 89, 202, 221, 222
power generation 55–6
underground lines 33
value of time (VOT) 52
see also individual countries;
transport infrastructure projects
railway systems, dedicated
additional components 266
analysis framework 268–70
and competition 263–80
competition cases 270–75
components of 266–8
concession contracts 271–2, 275
contracting out 265
contractual arrangements 264–70, 273, 278
design, build, operate and maintain (DBOM) 265–6, 268, 270, 271, 277–8
design freedom 270
essential components 266
fixed installations 266–8
horizontal dimension 270, 275
infrastructure 266, 267–8, 273, 275, 278
privatisation 263–4, 265
provision and management of 263–80
public–private partnerships 266, 273, 275
safety system 266–7
service provision 267–8, 278
tendering 270, 271, 273, 278
unbundling 263, 277
vehicles 266, 267–8, 275
vertical dimension 263, 268, 270, 273, 275, 277, 278
regulation see government;
institutional effects
Richmond, J. 120, 121
Rietveld, Piet 52, 107, 281–303
risk management
completion risks, large engineering projects 149, 150, 151
construction risks, large engineering projects 149, 150
decision-making on mega-projects 6–7, 11, 115
financial risks, large engineering projects 149–51, 159–61, 163, 164, 167–71, 184–6
large engineering projects 145–72
large engineering projects, institutional risks 149, 150, 151, 152, 159–60, 161, 164, 168
mega-projects 145–72, 182
oil platforms 149, 150
public–private partnership (PPP) 192, 202, 222–3, 318–19
regulatory risks, large engineering projects 149, 150, 151, 157, 165, 167
transport infrastructure projects 133–6, 137–8, 140
Rogelio, O. 229
Romania, design, build, finance, operate (DBFO) contract 198
Rose, L. and K. Stahlberg 315
Rose, R. 304, 305, 308–9
Rothengatter, Werner 4, 7–8, 40, 47, 50, 60, 84, 87, 105, 110, 116, 121, 137, 147, 176, 182, 197, 207, 215–38, 318
Salter, L. 92
Samset, Knut 170, 173–88
Schaafsma, A. 268
Schade, W. 230
Shaoul, J. 200
Short, J. and A. Kopp 4, 7, 8–11, 12, 105
Simon, H. 27
Singapore, institutional framework 304
Skamris, M. 121
South Africa, public–private partnership (PPP) 190, 197
South America
build, operate and transfer (BOT) contracts 194–5
contract renegotiation 207
public–private partnership (PPP) 197, 207
water concessions 207
see also individual countries
South East Asia
public–private partnership (PPP) 197
see also individual countries
Spackman, M. 190, 191
Spain
Metro Madrid, Line 9 271–2
Private Finance Initiative (PFI) 197
public–private partnership (PPP) 197
Pyrenees rail crossing 232
rail projects 232
TEN (Trans-European Network) high-priority projects 231, 232
toll roads 196–7
water and sewage 198
sponsorship
decision-making on mega-projects 6
large engineering projects 146, 150, 151, 153, 154, 158–61, 163–5, 167, 168, 170–71
stakeholder involvement
large engineering projects 156, 157, 160, 161, 164, 167
mega-projects 176–8, 180, 181, 183, 186, 218
mega-projects and contested information 91–2, 96, 98, 139, 241, 255
public–private partnership (PPP) 205–6
Stone, D. 304
Stubbs, J. and F. Jegede 281, 283, 290
Sweden
Arlanda rail link, Stockholm 271, 282
institutional transport investment structures 312, 314, 315, 316, 317
Oeresund tunnel 195, 216
public referenda on infrastructure initiatives 316–17
public–private partnership (PPP) 318
Stockholm metro 315
TEN (Trans-European Network) high-priority projects 231
Switzerland
ASTRA-T modules and interfaces 229–31
freight lorry restrictions 317
institutional transport investment structures 312, 314
institutional framework 304
Zürich Airport rail link 284
Szliwicz, J. and A. Goetz 121
Tavasszy, Lóránt A. 40–65
technological sublime
aesthetic sublime 257, 259–60
ChronicleWatch, San Francisco Chronicle 259
contingency schedule uplift 258–60
cost 239–62
design experts 249, 257
field guide to 241–3
functional sublime 257
future research 259–60
obsolescence 242–3
optimism bias uplift 258
as political tool 243
public design process 246–50, 258, 259–60
public outreach 250
reference class forecasting 257
regional mega-landmark phase 247–50
state tinker toy phase 247, 254–5
technological sublime, San Francisco–Oakland Bay Bridge 239, 241–50, 251
design form and function 250–55, 256–7
environmental concerns 254–5
as joint venture 255
observations, implications and recommendations 255–60
project definition 256–7
toll charges 255
Teisman, G. 12, 94, 112
Ten Heuvelhof, Ernst F. 34, 92, 96, 263–80
tendering
market situation 47, 60
railway systems, dedicated 270, 271, 273, 278
tenders and market situation, transport infrastructure projects 47, 60
Thailand
Bangkok Elevated Transport System 207
build, operate and invest (BOT) contracts 197, 198
public–private partnership (PPP) 197, 198, 207
thermal power projects, risk management 149
toll charging
California roads 197
France 196–7
Great Belt toll bridge, Denmark 195
public–private partnership (PPP) 194, 195, 196–7, 318
shadow toll 194
Spain 196–7
transport infrastructure projects
accessibility 44, 69, 75, 107, 114
accountability 138–9
additional travel (induced demand) category 42
agglomeration effects 51, 69, 71, 72–3, 77, 78
appraisal methods 76–80, 108–10, 114–15
ASTRA-T modules and interfaces 229–31, 234–6
benefits, methodological issues on 50–56
bias in 133–6, 137–8, 140
change evaluation 44–6
characteristics of 240–41
competition, economic impact on 70, 77, 78, 139–40, 220
competition, imperfect 69–70, 71–2, 74, 77, 78
construction costs estimations, research methods 47
construction period 49
cost forecasting, geographic variations 131–3
cost forecasting inaccuracy 125–8, 130, 131, 139–40
cost–benefit analysis see transport infrastructure projects, cost–benefit analysis
cross-border harmonisation 54–5
demand forecasting 50–51, 58, 59, 74–5, 114
demand forecasting, accuracy improvement 128–31, 133–6
demand forecasting, inaccuracy in 121–5
discount rates 43, 49, 56–7, 60
discount rates and taxation 79–80, 110
dynamic models 60
E3ME (econometric/transport) modelling approach 227
economic impact, effect of total 70–71
economic impacts 45–6, 49, 50, 55, 57, 58, 67–83, 88, 89–90, 107, 109, 110, 125, 220–21
economic impacts, empirical evidence 12, 73–6
economic impacts, modelling 60–61
emissions location 53–4, 89
environmental impacts, non-conventional 53–4
economic impacts, modelling 60–61
emissions location 53–4, 89
environmental impacts, non-conventional 53–4
environmental and safety aspects 43, 44, 45, 49, 50, 52–3, 55–6, 57, 59, 78, 89, 90, 107, 221, 241, 308
feasibility study 222
freight characteristics 41, 45, 54, 76
freight demand modelling 57–8, 59
good governance 138–40
grants 138
‘iceberg’ transport costs 76
indirect effects 46, 51, 52–3, 55, 60
informal institutions 307–9
institutional effects see institutional effects
labour-market effects 71–3, 74, 76, 77–8, 79–80, 89
land use and demand forecasting 50–51
land-use and transport interaction (LUTI) models 46, 50–51
lessons learned 215–18
LGV movements 57
life-cycle costs and project alternatives 49–50
life-cycle energy use and emissions 52–3
maintenance and repairs 49–50
mark-up of costs 69–70, 73–4
microeconomic and macroeconomic arguments 67–9
network effects 57, 58–9, 75, 79–80
new technology costs, uncertainty in 50, 58
non-user benefits 56
open space evaluation 51
output elasticity 68–9
passenger characteristics 41, 42, 45, 54, 56, 59, 76
planning ethics 136–8
policy robustness 54, 107
policy transplantation 305, 306–11
political distance 139
power generation 55–6
pricing policy 110
private capital involvement 220
problem analysis 107–8, 109–10, 114–15
productivity levels 71, 72–3, 77–8
professional penalties for inaccuracy 139
project alternatives 49–50, 54
public planning and cost estimation 120–44
public procurement policies for private funding and contracting 318–20
public referenda 316–17
public–private partnerships 79–80, 139–40, 190, 197, 318–20
reference class forecasting 48, 133–6, 258
risk reduction 133–6, 137–8, 140
road types classification 44
smog, dealing with 308
spatial boundaries 43
spatial computable general equilibrium models (SCGE) 46, 57, 60, 74–5, 76, 77–8, 227
specification changes 49
subsidies, public sector 68
system boundaries 88
system dynamic models (SDM) 227, 228–30
temporal boundaries 43
TEN (Trans-European Network) high-priority projects 231
tenders and market situation 47, 60
timetable changes 42–3, 49, 59
travel time reliability 52, 61
travel time savings 41, 42, 44–5, 52, 55, 58, 59, 72, 77, 78
traveller benefits modelling via logsums 59
user’s option value 56
value of time (VOT) 41, 49, 52
wage levels 72
welfare considerations 42, 47, 60, 74–5, 76, 78, 231, 290
see also large engineering projects; ‘rail’ headings
transport infrastructure projects, cost-benefit analysis (CBA) 41–6, 139, 217, 227–8, 231, 234–6
methodological issues 47–50
modelling 44–6, 57–61, 227, 228–30, 234
multi-criteria analysis (MCA) 41–2, 114–15
optimism bias 48, 240
popularity of 41
strategic behaviour 48, 49
wider economic benefits from mega-projects 67–83
Trujillo, L. 48
tunnels
Channel 32, 79, 207, 223
Cross Harbour Tunnel (CHT), Hong Kong 197
Dortmund subway tunnel, Germany 37
Great Belt Bridge and Tunnel, Denmark 216
Herrentunnel, Lübeck, Germany 30
market-related risks 150
Netherlands 26, 200
New Austrian Tunnelling Method 26
Oeresund tunnel, Denmark 195, 216
risk management 149
road tunnels, Netherlands 200
tram 33
Tweede Heineenoordtunnel, Netherlands 26
Warnow tunnel, Germany 87
Westerscheldt Tunnel, Netherlands 195
UK
air–rail intermodality barriers 290, 298–9, 301
Airtrack, London 288–9
Channel Tunnel 32, 79, 207, 223
Channel Tunnel Rail Link 196, 207, 216, 299
Crossrail, London 78, 288
Index

transport infrastructure projects 50, 58

Upton, D. 242

USA

Boston, Central Artery/Tunnel project 25–6, 37
Boston, Post Office Square 26
build, operate and invest (BOT) contracts 197
cost overruns 131, 132
electricity blackout (2003) 28–9
human service contracting 199
institutional transport investment structures 312, 314, 316, 317, 320–21
institutional framework 304
light rail systems 10
Massachusetts correctional facility 200
Planners’ Code of Ethics 137
project finance 12
rail–private partnership (PPP) 197, 198–9, 200
rail links to airports, number of 281
railway expansion, early 242
San Francisco Bay Area 36, 320–21
San Francisco–Oakland Bay Bridge see technological sublime, San Francisco–Oakland Bay Bridge
Tacoma Narrows Bridge, Washington (Innovative technology) 27
technological sublime 242
toll roads, California 197
water and wastewater treatment 198–9, 202
Yerba Buena Island 243, 244, 245, 247, 251, 252
utilities 157

Van Bueren, E. 304
Van de Velde, Didier 263–80
Van de Graaf, H. 93
Van Eeten, M. 97
Van Gigch, J. 27
Van Ham, J. and J. Koppenjan 191, 195, 201, 206
Van Twist, M. 268
Van Wee, Bert 1–20, 40–65, 120
Van Wijk, M. 293

Eddington Report (transport policy) 289–90
Eurostar HST rail services 299
Gatwick Airport rail link 283, 284, 297, 299
Heathrow Airport, London, profile of 285–90, 296, 297, 298–9
Heathrow Connect, London 287, 288
Heathrow Express, London 271, 282, 283, 284, 287, 288
hospitals and schools projects 199, 200
institutional transport investment structures 312, 314, 318
institutional framework 304, 309–10
Jubilee Line extension, London 189
light rail systems 10
London Underground 189, 204, 207, 282, 283, 287
Manchester airport rail link 283, 284, 289
market restructuring 70, 74, 76, 77
Piccadilly Line, London 282, 283, 287
Planners’ Code of Ethics 137
Prestwick airport rail station 283
prison projects 199
Private Finance Initiative (PFI) 190, 194, 196, 197, 199, 200, 205
privatisation, effects of 297, 298
public–private partnership (PPP) 190, 196, 200, 318, 319–20
railway projects, early 215
road projects 199, 200, 204
Skye Bridge 196, 200
south–north HST rail line, proposed 289
Stansted Airport, London rail link 284, 297, 299
TEN (Trans-European Network) high-priority projects 231, 232
transport infrastructure projects, optimism bias 48
water and sewage 198
West Coast railway line 232
uncertainty
management 32–4, 35–7
mega-projects and contested information 86
Index

Varga, A. 61
Venables, A. 71, 72, 76, 77, 78
Venables, A. and M. Gasiorek 51, 69, 75, 76
Vickerman, Roger W. 66–83, 107, 235
Vietnam, build, operate and invest (BOT) contracts 197, 198
Vollaard, B. and W. Witteveen 265
Wachs, M. 7, 48, 105, 131, 137
Walker, B. and B. Walker 202
Walker, C. and A. Smith 192
Walmsley, D. and M. Pickett 121
Wardman, M. 52
wastewater treatment 193–4, 197, 198
water management, and public–private partnership (PPP) 189, 190, 196, 198
Watson, A. 305

Watson, V. 137
Webber, M. 121
Wegener, M. and F. Fürst 50
welfare considerations, transport infrastructure projects 42, 47, 60, 74–5, 76, 78, 231, 290
Wildavsky, A. 85, 93
Winston, C. 263
World Bank appraisal optimism 7
CBA categorization 44
project success study 177
state capability enhancement model 182
Yiftachel, O. 137
Zoeteman, A. 50, 278
Zweigert, K. and H. Kötz 309